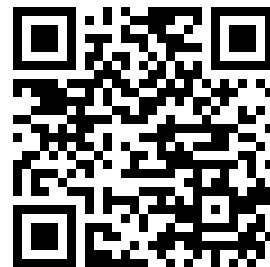

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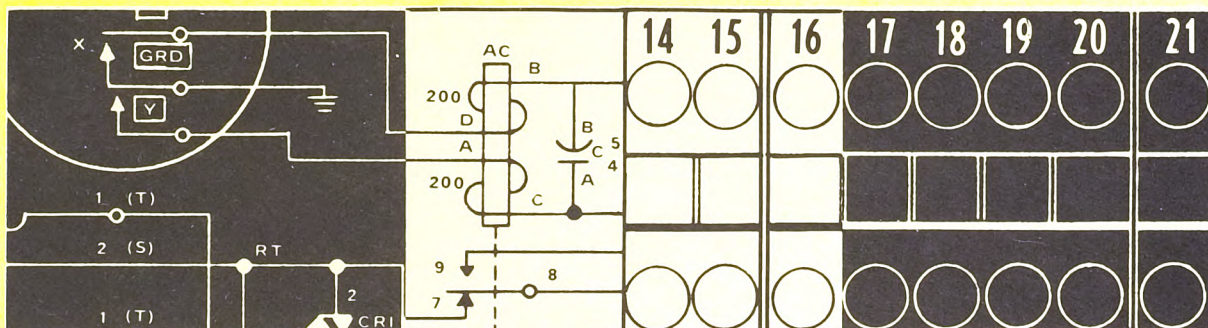
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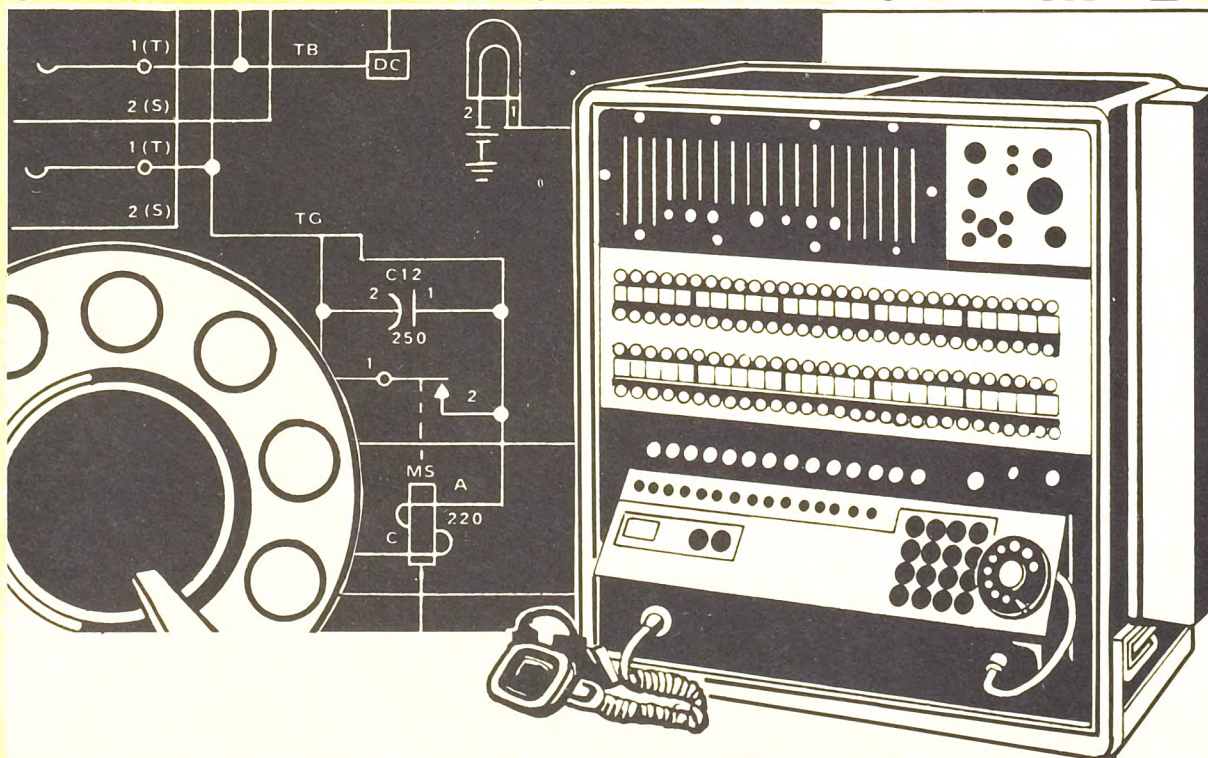
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FM 11-36H1/2
HEADQUARTERS
DEPARTMENT OF THE ARMY

SOLDIER'S MANUAL



MOS 36H DIAL/MANUAL CENTRAL OFFICE REPAIRER SKILL LEVELS 1 AND 2



FEBRUARY 1980

FIELD MANUAL
No. 11-36H1/2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 26 FEBRUARY 1980

Soldier's Manual

MOS 36H DIAL/MANUAL CENTRAL OFFICE REPAIRER

SKILL LEVELS 1 AND 2

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Whenever pronouns or other references denoting gender appear in this manual, they are meant to refer to either male or female—unless indicated otherwise.

COMMANDER'S ATTENTION

PAGE

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Soldier's Manuals are designed to tell soldiers what tasks they must be proficient in to be MOS qualified. If soldiers follow the road map these manuals provide, they should progress readily to positions of responsibility commensurate with their aptitude and motivation.

Initial distribution of Soldier's Manuals will be made to the unit level, based upon assigned strength in the particular MOS and Skill Level. In the event additional manuals are needed by the unit for MOS study, libraries, or other training needs, requests for publications may be sent directly to the US Army Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

When soldiers are issued Soldier's Manuals by their units, they are responsible for retaining and maintaining them. If they transfer, they must return the manuals to their units.

Upon promotion, the soldier may order the next higher level Soldier's Manual through his/her unit.

This Soldier's Manual was prepared by the US Army Signal Center.


 WILLIAM J. WILSMAN
 Major General, USA
 Commanding

RESERVE COMPONENT ARMY NATIONAL GUARD - ARMY RESERVE

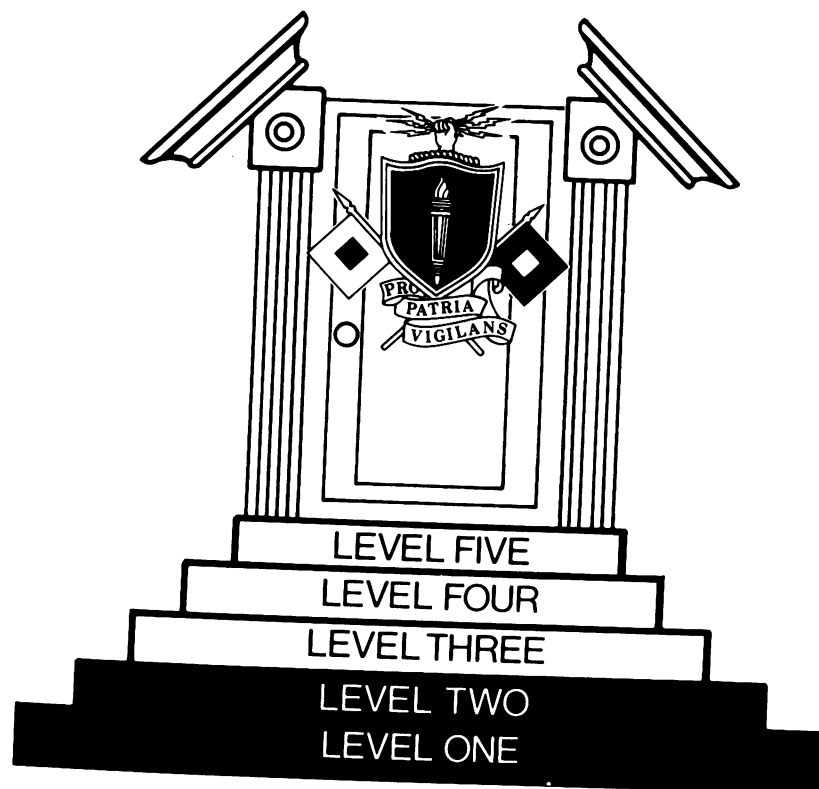
You will be using this soldier's manual along with your Active Army counterpart.

This manual contains the critical tasks to be performed by soldiers in MOS 36H, Dial/Manual Central Office Repairer. However, some tasks may require modification due to differences in equipment, facilities, and training time available to you. Tasks that are unique to some reserve components are identified by (RC) in the task inventory list.

Many tasks that you learned in basic training (BT) and advanced individual training (AIT) are in this manual. Others are critical tasks that you are responsible for learning on your own. Training references and materials are available and can be provided to you through your unit. Your performance in your duty position will be tested on your ability to perform the critical tasks in this manual. It is to your advantage to take the initiative NOW.

Chapter 1

INTRODUCTION



THE SOLDIER'S MANUAL AND YOU

This manual describes what the Army expects you to know and to be able to do as a Dial/Manual Central Office Repairer, MOS 36H. In addition to job tasks, this manual tells you about the management and training systems designed to help you learn your job.

If you don't understand some parts of the manual or want to know more about promotion, see your NCO/supervisor. Take your superior's advice, it is based on knowledge and experience.

The Army wants and needs well-trained soldiers who want to get ahead. This manual and the assistance of your senior NCOs can lead to promotion.

Keep your manual up to date. When new or changed material is published, it will be given to you with instructions on how and where to put it in your manual.

MILITARY OCCUPATIONAL SPECIALTY

A military occupational specialty (MOS) is defined as a grouping of closely related jobs or duty positions. An MOS code consists of five characters which have specific meanings.

First Three Characters: These are two numbers and one letter. Together, they identify the specific specialty in a certain career field. The 36H in your MOS identifies the Dial/Manual Central Office Repairer portion of the Communications-Electronics Maintenance Career Management Field.

Fourth Character: This is a number which indicates the skill level of the individual in that MOS.

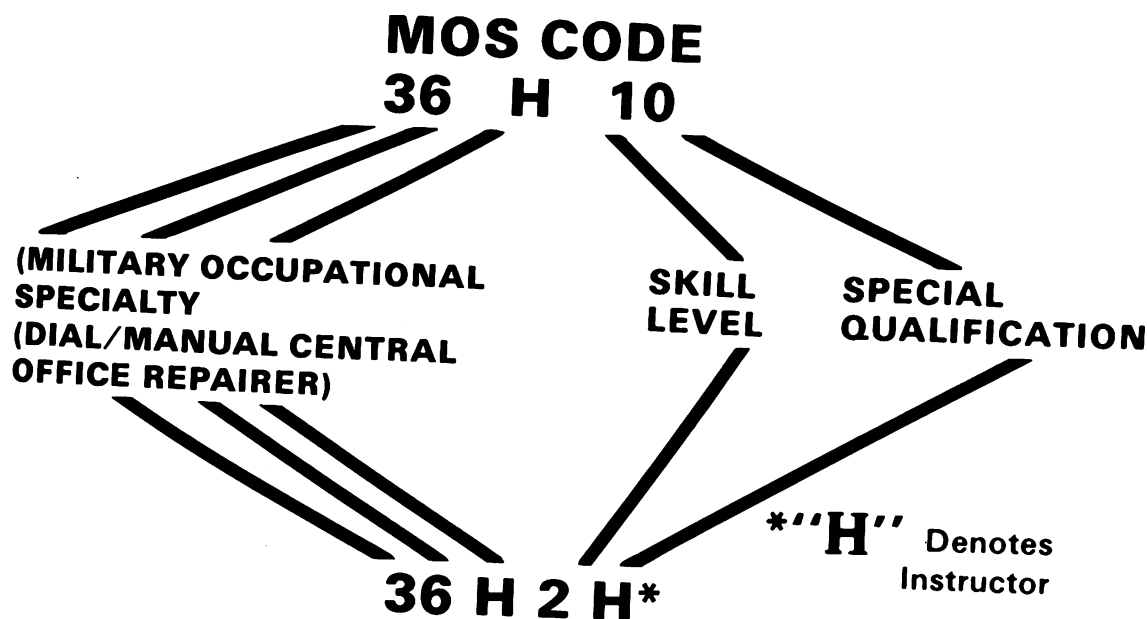
Fifth Character: This is a letter which identifies a special qualification in the MOS. The letter "O" will always be inserted as the MOS code if the individual has no additional special qualifications. Here are two examples of fifth character usage:

36H2H, Dial/Manual Central Office Repairer - Qualified as an instructor.

36H20, Dial/Manual Central Office Repairer - No special qualifications.

SKILL LEVELS

The skill level is a means of showing your level of experience and knowledge in your MOS. The Army uses five skill levels and each is identified by the fourth character of the MOS code. 36H10 indicates MOS 36H Skill Level 1 (E1 through E4). 36H20 indicates MOS 36H Skill Level 2 (E5).



Skill Level 1 is the first step in your MOS; this is where you start as a helper. You will be able to do the simple tasks on your own, the difficult tasks you will do under close supervision of your NCO.

Skill Level 2 is the second step in your MOS; the tasks you did in Skill Level 1 should be routine now. Only the more difficult tasks will be performed under the general supervision of your NCO.

The following paragraphs list the duties of MOS 36H at Skill Levels 1 and 2.

Skill Level 1 (AR 611-201):

1. Installs, inspects, positions, aligns, secures and performs all levels of maintenance on dial/manual central office telephone exchange equipment.
2. Margins relays to current values by adjusting spring tensions. Adjusts and positions pileups to provide make-and-break contacts in proper sequence and timing.
3. Adjusts all types of dial/manual system switches. Tests to locate malfunctions in dial/manual central office equipment. Collaborates with outside plant personnel in clearing line troubles. Operates and repairs traffic recording equipment.

4. Conducts operating and electrical tests, and compares results with specified standard for type of equipment under repair. Identifies common causes of malfunction and nonfunction of equipment.
5. Replaces parts, rewires equipment, and interconnects components. Test-operates repaired equipment to assure proper functioning. Makes additional corrections and adjustments to bring equipment up to required performance level. Treats equipment to prevent damage by moisture and fungus.
6. Reads and understands circuit diagrams and schematic symbols. Computes voltage, amperage, and resistance factors with simple algebraic formulas. Troubleshoots, diagnoses, locates malfunctions, replaces parts and repairs local battery switches, common battery switches, stroeger two-motion switches, rotary line switches, connector switches, power equipment, transmission batteries, switchboards, A & C type relays, and associated parts.
7. Employs electrician's common and specialized handtools, measuring devices, test equipment, and test instruments. Performs organizational maintenance on tools and test equipment. Measures voltage, resistance, and current in series-paralleled circuits.
8. Performs technical inspection of central office equipment. Recognizes electronic countermeasure and applies appropriate electronic counter-countermeasures.

Skill Level 2 (AR 611-201):

Performs all tasks that a 36H10 performs, only with a higher degree of proficiency with less supervision.

CONTENTS OF YOUR SOLDIER'S MANUAL

In order to use your soldier's manual you will have to know some of the terms used in it. These terms are listed below:

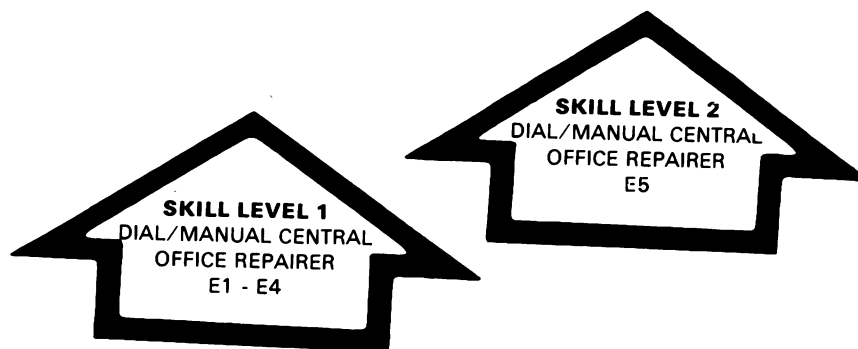
Critical Skill Level Task: A task which you must perform to do your job.

Common Task: A task common to every soldier in the Army at a given skill level, regardless of MOS.

GO NO GO: These terms are used in testing. If you are graded GO, you have passed; a NO GO means you have failed.

Job: The tasks performed by you in order to do your job.

Duty Position: This is a job in an MOS.



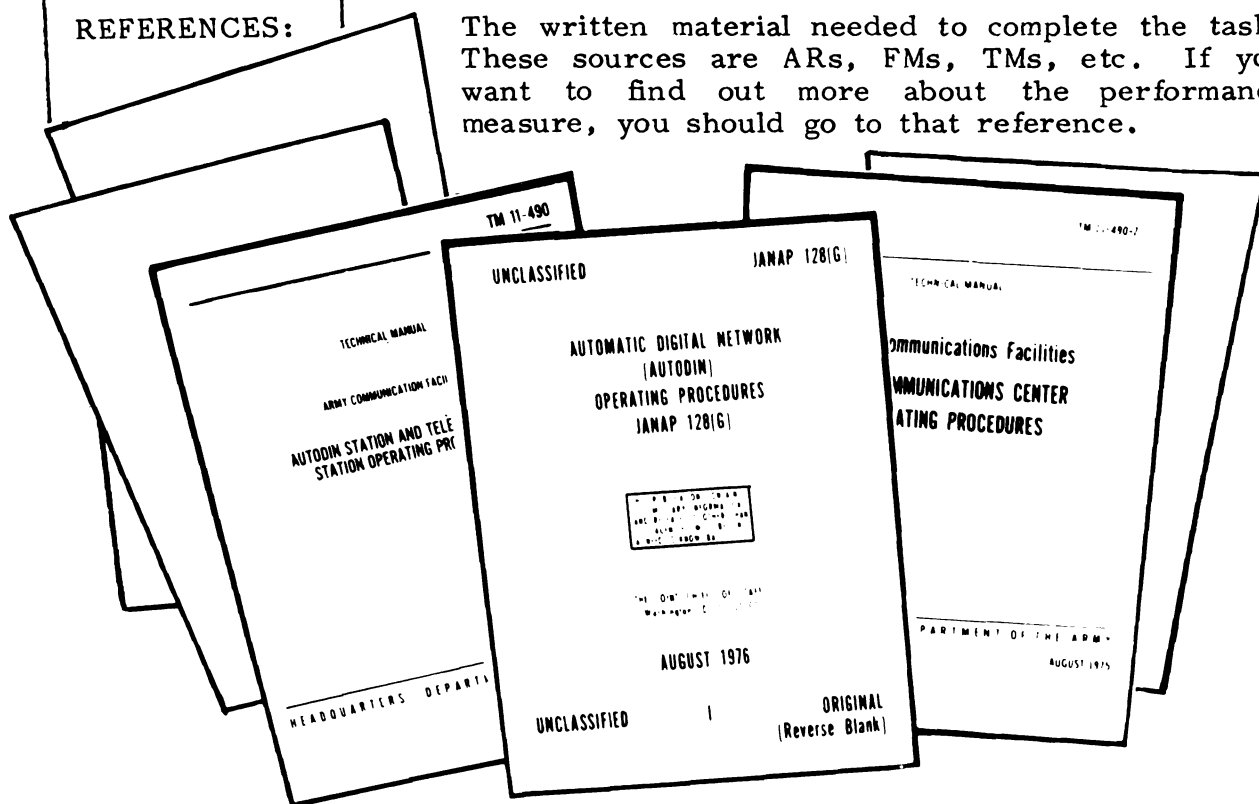
The manual lists and describes the critical tasks for Skill Level 1 and Skill Level 2 of your MOS. The following breakdown shows the grades for the skill levels in your manual:

SKILL LEVELS	GRADES
1	E1-E4
2	E5

At the beginning of each succeeding chapter in your soldier's manual, there is a list of common and critical tasks and their titles. These tasks are the most important parts of your job.

Each task is split into these parts:

TASK:	A statement of what you must be able to do, for example: Repair Telephone Assembly TA-312/PT.
CONDITIONS:	The situation in which you must be able to do the task; e.g., a tactical or a nontactical situation under all weather conditions. It also lists the equipment and references that will be used.
STANDARDS:	A statement of how well or how accurately you must do the task.
PERFORMANCE MEASURES:	An outline of what you must know and do to complete the task.
REFERENCES:	The written material needed to complete the task. These sources are ARs, FM's, TMs, etc. If you want to find out more about the performance measure, you should go to that reference.

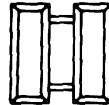


YOUR MANUAL AND YOUR LEADERS

You are not the only one who will use this manual. Who else uses it?

COMMANDER

Plans your training, makes available training time and insures availability of training resources.

**COMMAND SERGEANT MAJOR**

Participates in the planning of your training.

**FIRST SERGEANT**

Participates in the planning of your training.

**PLATOON SERGEANT**

Participates in your actual training.

**MAINTENANCE SUPERVISOR**

Participates in your actual training.



Your commander has a manual, in addition to the soldier's manual, which lists the common and critical tasks you are required to perform and the methods of training that can help you learn those tasks. It is called the Commander's Manual. The commander's manual provides your commander and supervisor with a means to help you with a training program. The soldier's manual and commander's manual are also designed to assist your commander and supervisor in evaluating your skills. Your ability to do your job will be based on how well you do the tasks listed in your soldier's manual.

HOW TO USE YOUR SOLDIER'S MANUAL

You should begin to use your soldier's manual by studying, practicing, and mastering the tasks listed for Skill Level 1. You learned most of them in AIT. You learned others while working on the job. It really doesn't matter where or when you first learned a task. The important question is: how well can you do it now?

If you do not understand a certain task, ask your supervisor to explain it and to assist you in getting the right study aids and references. The senior NCOs and officers in your unit use the soldier's manual to help them plan your training and to evaluate your skills. Ask them for advice and help. They want to help you.

When you are sure that you have mastered all the Skill Level 1 tasks, proceed to the Skill Level 2 tasks. Continue to study and practice until you have mastered all the tasks for both Skill Levels 1 and 2.

Once you have been promoted to E5, you should immediately begin to master the Skill Level 3 tasks.

Two points to remember about the tasks in your soldier's manual:

To qualify for promotion, you must master the tasks for the grade in which you are now serving.

As you progress to higher skill levels, you remain responsible for all the tasks listed for the lower skill levels.

ENLISTED PERSONNEL MANAGEMENT SYSTEM (EPMS)

The Army has adopted the EPMS to give you a better opportunity for attaining and maintaining skills through improved training programs. If you want to be successful, you must perform your assigned duties efficiently, take advantage of opportunities for training and promotion, and establish personal career goals.

One of the aims of EPMS is to provide a logical path of career development for soldiers. It also establishes a system of career-long training that prepares a soldier to take on duties at the next higher grade. The training consists of AIT for Skill Level 1, and periods of on-the-job experience (OJE) or formal training under the Noncommissioned Officer Education System (NCOES) for Skill Levels 2 through 5.

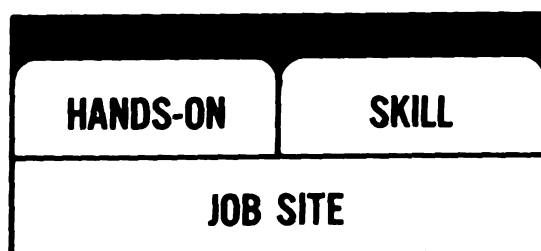
EPMS provides you with a fair and reasonable promotion system. Under EPMS, you must receive a passing score on your skill qualification test (SQT) before you can be considered for promotion. However, a passing score on your SQT does not guarantee promotion. You must be

recommended by your commander and satisfy all administrative requirements (e.g., time in grade, time in service, etc.). Your best recommendation is the manner in which you do your job and your personal behavior and efforts.

SKILL QUALIFICATION TEST (SQT)

The SQT is a performance oriented test of your ability to do your job. The SQT will be composed of scorable units or subtests. The SQT score is based upon the number of scorable units you pass, e.g., if a scorable unit consists of four questions, you may be required to answer three correctly to get a GO or passing score for the unit. You will be informed of the standard for each scorable unit in your SQT Notice.

The SQT may be composed of three major components:



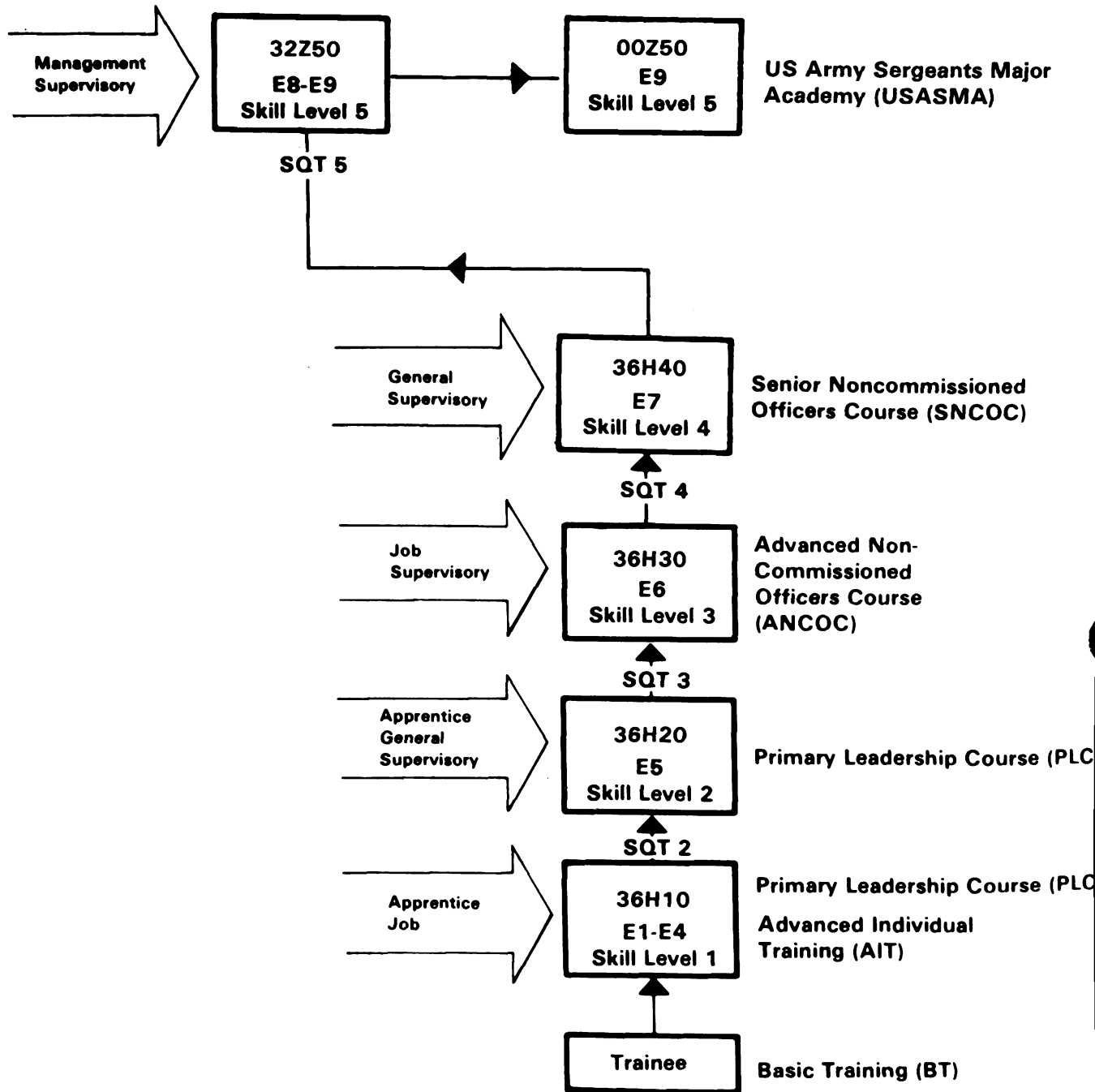
The Hands-On Component (HOC) is designed to test your ability to perform certain critical tasks using real equipment or training aids.

The Skill Component (SC) will be groups of multiple choice questions designed to test your ability to perform certain critical tasks.

The Job Site Component (JSC) will be an evaluation, made by your commander or supervisor, of your ability to perform certain critical tasks. The type tasks to be placed in the JSC are those that require physical skills and a great amount of time to perform.

Some SQTs may not have three components because they will be evaluating a low-density MOS, or there is not enough equipment, or not enough MOS holders at one location. This may change from year to year and you will be informed of such changes in your SQT Notice.

SKILL AND TRAINING PROGRESSION FOR MOS 36H



After the SQT has been taken and scored, you will receive a report showing your score and telling you which scorable units received a NO GO during your test.

The SQT score is used to verify your current skill level. Skill Level 1 MOS holders will take SQT-2 which will be composed of Skill Level 1 tasks. Skill Level 2 MOS holders will take SQT-3 which will consist of Skill Level 1 and 2 tasks.

Approximately 60 to 90 days before you are tested, you will receive an SQT Notice. This notice will list the tasks to be tested in each component of the SQT, and where you can find the tasks in the soldier's manual. It will give you examples of the type questions that will appear in the skill component and the performance tests that will appear in the hands-on and job site components.

IF YOU DO NOT RECEIVE YOUR SQT NOTICE AT LEAST 60 DAYS PRIOR TO THE TEST DATE, CONTACT YOUR SUPERVISOR OR COMMANDER.

ENLISTED EVALUATION SYSTEM

This system evaluates your ability to do your job, your attitude toward the military service in general, and your potential for increased responsibility and eventual promotion. As a soldier in grades E1 through E4, you will be evaluated by means of the SQT and a local (unit) evaluation report. The evaluation report gives your commander an indication of your attitude toward your job, how well you work with others, and your possible leadership ability. Using the results of the SQT and the evaluation report your commander can compare you with all soldiers in the unit having the same MOS, skill level, and pay grade. Your commander can determine your eligibility for:

- Keeping your present MOS and skill level.
- Promotion to the next higher grade.
- Reenlistment.
- Schooling.

As a soldier in grade E5, you will be evaluated by means of the SQT and the Senior Enlisted Evaluation Report (SEER). The SEER is used by your supervisor to report information about your duty performance that cannot be measured by the SQT. Your attitude toward your job, how well you work with others as a team member, and your leadership ability are among the rated characteristics. If you get along with others and do your job satisfactorily, your SEERs will be good.

Your SQT and SEER scores will be important factors in your Army career. They will be used to compare you with all other soldiers in the Army having the same MOS, skill level, and pay grade. They will have a part in determining your eligibility for:

Keeping of your present MOS and skill level.

Promotion to the next higher skill level.

Reclassification into a different MOS.

Staying in the Army.

Reenlistment.

Military and civilian schooling.

SUMMARY

Your soldier's manual provides the basic parts of mutual interest to you and the Army--the critical tasks that you must be able to perform to be a successful soldier. Follow the step-by-step procedure as outlined and you will open the door to advancement.

STEP ONE: Use your soldier's manual and keep it updated.

STEP TWO: Know your MOS, skill level, and duty position.

STEP THREE: Find the critical tasks that you must master and use the references listed for each task. Refer to appendix B for tips in planning your training program.

STEP FOUR: Study and practice the critical tasks until you are sure you have mastered them. Ask the officers and NCOs in your unit for help.

STEP FIVE: Once you have mastered the critical tasks for your present MOS, skill level, and duty position, prepare for your SQT by studying and practicing the tasks listed in the SQT Notice.

STEP SIX: When you are promoted, you may order your next higher soldier's manual using the order blank included at the end of this manual.

If you follow the above steps, you will be able to progress through a rewarding Army career. The Army wants and needs well-trained soldiers who desire to advance through the ranks. This manual and the willing assistance of your NCOs are tools you can use to your advantage.

You are encouraged to submit recommendations or comments to improve this manual. Key your comments to the specific page, paragraph, and line of text for which the change is recommended. Provide reasons for each comment to insure understanding and complete evaluation. Use DA Form 2028 (Recommended Changes to Publications and Blank Forms) if available. However, if DA Form 2028 is not available, a letter will be acceptable. Address form or letter to:

Commander
US Army Signal Center & Fort Gordon
ATTN: ATZHTD-A
Fort Gordon, Georgia 30905

Chapter 2

CRITICAL SKILL LEVEL TASKS

This chapter deals with common soldier tasks and technical tasks which have been identified as critical to Dial/Manual Central Office Repairer. Skill Level 1 and Skill Level 2 tasks are included. It is your duty to master all the tasks for Skill Level 1. When you feel that you can perform these tasks, you should start on the tasks for Skill Level 2.

TASK LIST

SKILL LEVEL 1

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
031-503-1001	Perform Operator's Maintenance on an M17 Series Protective Mask	2-6
031-503-1002	Put on and Wear a Protective Mask	2-10
031-503-1004	Recognize and Protect Self Against a CB Hazard	2-14
031-503-1005	Recognize and Protect Self Against a Nuclear Hazard	2-18
031-503-1006	Give Visual, Vocal, and/or Sound Alarms for Chemical or Biological Attack	2-21
031-503-1007	Decontaminate Self	2-23
031-503-1008	Decontaminate Individual Equipment	2-28
031-503-1010	Exchange Filters on an M17 Series Protective Mask	2-31
031-503-1014	Identify a Chemical Agent Using ABC-M8 Detector Paper	2-37
031-503-1015	Put on and Wear Protective Clothing	2-38
051-202-1001	Camouflage/Conceal Self and Individual Equipment	2-42

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
051-202-1002	Camouflage/Conceal Equipment	2-47
051-202-1003	Camouflage/Conceal Defensive Positions	2-49
071-311-2001	Perform Operator Maintenance on an M16A1 Rifle, Magazine, and Ammunition	2-52
071-311-2003	Load, Reduce a Stoppage, and Clear an M16A1 Rifle	2-65
071-311-2004	Battlesight Zero an M16A1 Rifle	2-70
071-311-2006	Use Limited Visibility Firing Techniques with the M16A1 Rifle	2-76
071-311-2007	Qualify with the M16A1 Rifle	2-78
071-325-4402	Engage Enemy Targets with Hand Grenades	2-81
071-327-0201	Maintain an Appropriate Level of Physical Fitness (Male Only)	2-86
071-327-0210	Maintain an Appropriate Level of Physical Fitness (Female Only)	2-89
071-329-1001	Identify Terrain Features (Natural and Manmade) on the Map	2-91
071-329-1002	Determine the Grid Coordinates of a Point on a Military Map Using the Military Grid Reference System	2-96
071-329-1004	Determine the Elevation of a Point on the Ground Using a Map	2-101
071-329-1005	Determine a Location on the Ground by Terrain Association	2-106
071-329-1006	Navigate from One Position on the Ground to Another Point	2-107
071-329-1007	Determine Distance While Moving Between Two Points on the Ground	2-109

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
071-329-1008	Measure Distance on a Map	2-112
071-329-1010	Determine Azimuths Using a Coordinate Scale and Protractor	2-115
071-329-1011	Orient a Map Using a Compass	2-118
071-329-1012	Orient a Map to the Ground by Map-Terrain Association	2-120
071-331-0801	Use Challenge and Password	2-122
071-331-0852	Clear Fields of Fire	2-124
081-831-1001	Perform Mouth-to-Mouth Resuscitation	2-127
081-831-1002	Perform Cardiopulmonary Resuscitation (CPR) Using One-Man Method	2-130
081-831-1003	Clear an Airway Using Heimlich Maneuver	2-135
081-831-1004	Apply First Aid Measures to Stop Bleeding	2-138
081-831-1005	Give First Aid to Prevent Shock	2-144
081-831-1006	Splint a Suspected Fracture	2-146
081-831-1007	Give First Aid for Burns	2-150
081-831-1008	Give First Aid for Heat Injuries	2-152
081-831-1009	Give First Aid for Wet or Cold Injuries	2-155
081-831-1010	Give First Aid for Snakebite	2-157
081-831-1011	Give First Aid to a Nerve Agent Casualty	2-159
081-831-1012	Give First Aid to a Blister Agent Casualty	2-162
081-831-1013	Give First Aid to a Blood Agent Casualty	2-165
081-831-1014	Apply Mask-to-Mouth Resuscitation to a Chemical Agent Casualty	2-167

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
081-831-1015	Give Back-Pressure Armlift Artificial Resuscitation to a Chemical Agent Casualty	2-172
081-851-1001	Disinfect Water for Drinking (Canteen)	2-175
121-004-1417	Receipt/Control Classified Material	2-177
121-004-1418	Transfer Classified Material	2-183
113-600-0004	Troubleshoot Telephone Assembly TA-236D and 554W	2-188
113-600-4004	Repair Telephone Assembly TA-236D and 554W	2-191
113-604-4005	Repair "A" Type Relays	2-193
113-604-4006	Repair "C" Type Relays	2-200
113-604-0060	Test "A" Type Relay Using Test Set Relay TS-1775/U	2-207

SKILL LEVEL 2

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
031-503-2002	Decontaminate Equipment Using ABC-M11 Decontamination Apparatus	2-213
031-503-2003	Place the Automatic Chemical Agent Alarm System into Operation	2-215
031-503-2004	Service the Automatic Chemical Agent Alarm System	2-219
071-327-0202	Lead Physical Conditioning Activities	2-221
071-328-5301	Inspect Personnel/Equipment	2-228
071-328-5302	Supervise Maintenance on Individual and TOE Equipment	2-230
071-328-5304	Enforce Preventive Medicine Program (Includes Personal Hygiene)	2-231
071-331-0807	Enforce Noise, Light, and Litter Discipline	2-236
874-896-2010	Prepare to Conduct Individual Training	2-238
874-896-2020	Conduct Individual Training	2-241

TASK**031-503-1001**

**Perform Operator's Maintenance on an
M17 Series Protective Mask**

CONDITIONS

Given a dirty M17 series protective mask, carrier, accessories authorized to be stored in the carrier (per unit SOP), TM 3-4240-279-10, a pail of soapy water, a pail of clear rinse water, rags, and a small brush.

STANDARDS

1. All components and accessories authorized by unit SOP are present; any that are missing are reported to your supervisor.
2. All deficiencies not requiring higher echelon support have been corrected. Those which do require such support are reported to your supervisor.
3. Mask and carrier are free of dirt, sand, and grit.

PERFORMANCE MEASURES

1. Inspect Mask and Carrier.
 - a. Remove the mask from the carrier and check to insure that all components are present (fig 1). Insure that accessories authorized by your unit SOP are present (fig 2). Inform your supervisor if any components or accessories are missing.
 - b. Check the carrier for superficial dirt, mildew, rips, torn straps, and missing hardware.
 - c. Check the facepiece for holes, tears, splits, and signs of deterioration of rubber parts.

- d. Check the filter elements to make sure that they are serviceable and properly installed.
- e. Check outserts for scratches, discoloration, or distortion that could affect vision.
- f. Check the head harness for dirt and mildew; worn, frayed, or broken straps; and missing clinch tips.
- g. If present, check the hood for holes, rips, tears, or excessive wear. The hood is unserviceable if it has more than two pinholes in any one panel.

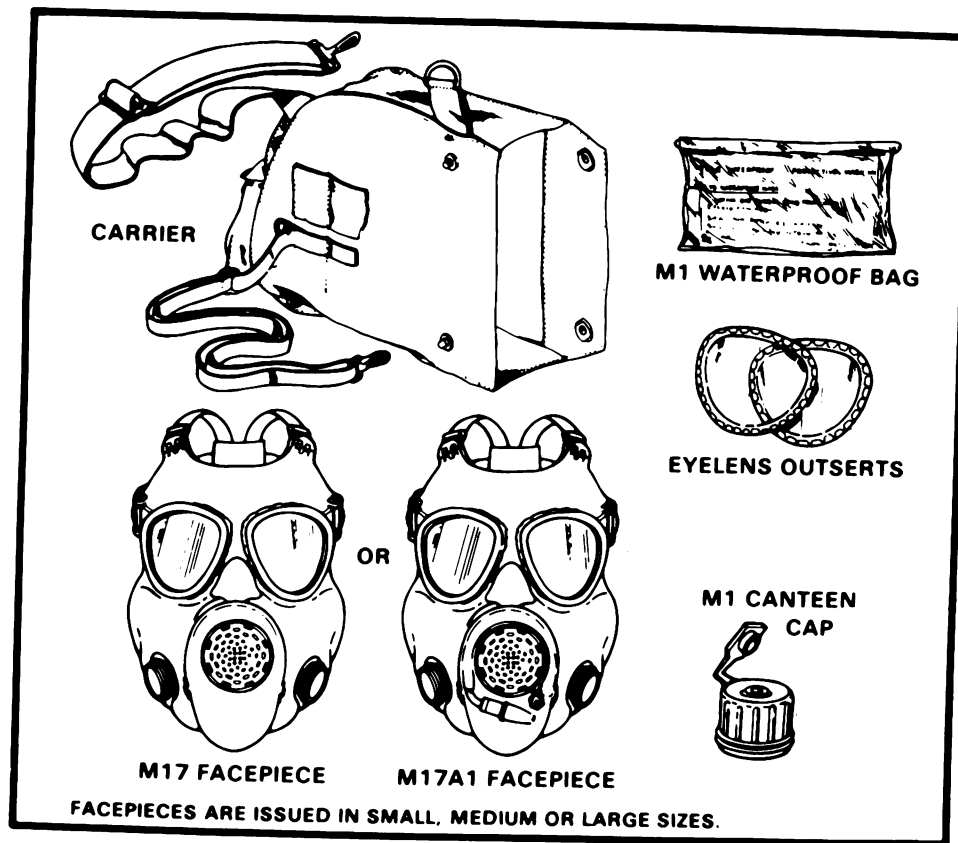


Figure 1. Protective mask and components.

- h. Correct deficiencies which you are authorized to correct at your level. (See TM 3-4240-279-10, sec III, pp 3-5 thru 3-12.)
- i. Notify your supervisor of any deficiencies which must be corrected at a higher level.

2. Clean the Mask (Without Removing Filter Elements).

- a. If there is a hood, keep it attached to the mask.
- b. Remove the voicemitter-outlet cover, inlet valve caps, and eyelens outserts.
- c. Clean the mask inside and out with a cloth dipped in warm, soapy water (wrung almost dry) or a brush with soft bristles, being careful not to wet the filter elements.
- d. Rinse with a cloth dipped in warm, clear water (wrung almost dry).
- e. Wipe the facepiece with a clean, lint-free cloth or air-dry.

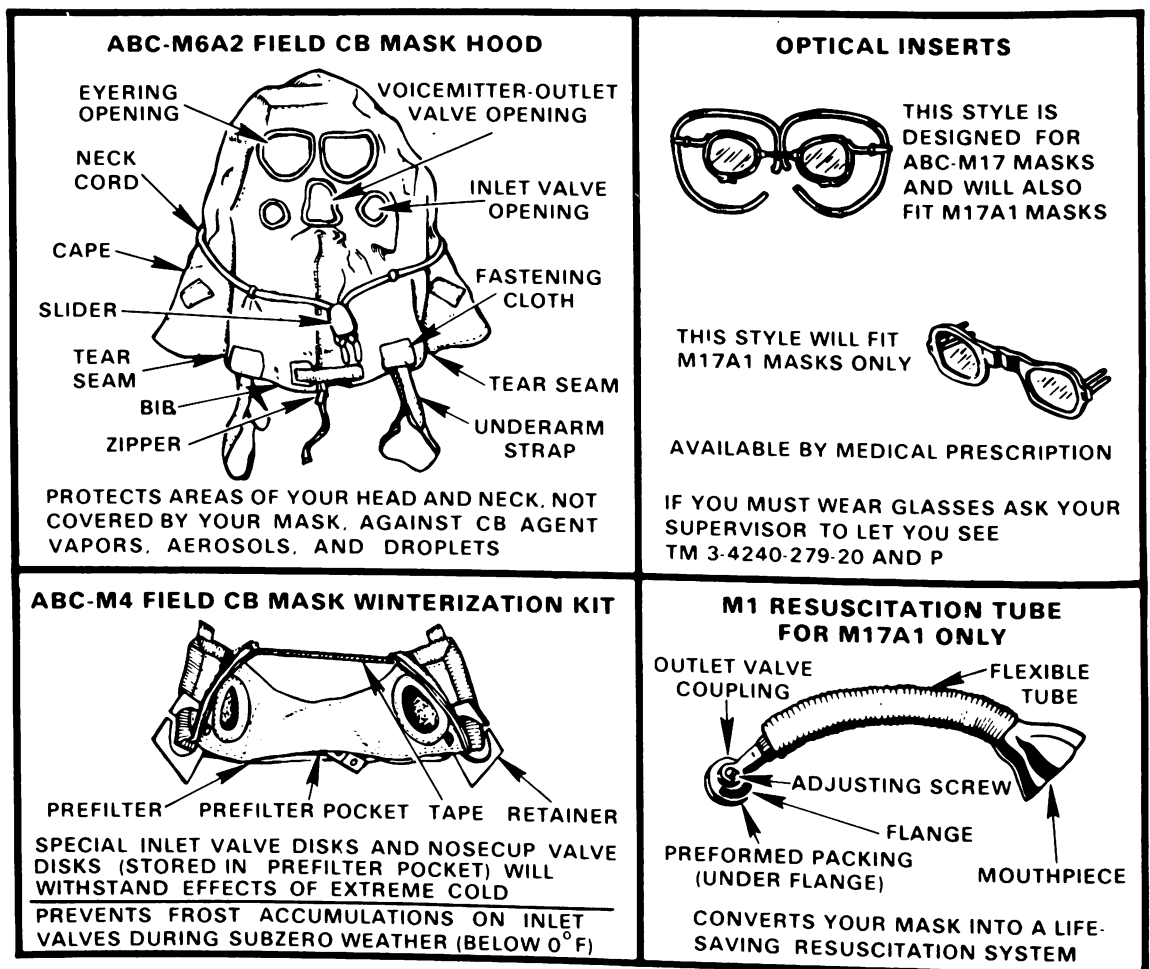


Figure 2. Protective mask accessories

- f. If the nosecup valve disks become detached while the mask is being cleaned, reinstall them.
 - g. Reassemble the mask.
3. Clean the Carrier.
- a. Empty the carrier pockets.
 - b. Brush the carrier both inside and outside to remove sand or grit.
 - c. If the carrier is soiled, clean it with a brush dipped in clear, cold water.
 - d. Put components and authorized accessories back in the carrier.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app B, pp B-4 thru B-6.

TM 3-4240-279-10, Operator's Manual: Mask, Chemical-Biological: Field ABC-M17/M17A1 and Accessories, chap 3, pp 3-1 thru 3-14, Aug 75.

TM 3-4240-279-20 & P, w/C1 and 2, Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Mask, Chemical-Biological; Field, ABC M17/M17A1 and Accessories, Aug 75.

TEC Lesson 931-061-0065-A, NBC: Maintenance of the M17 Series Mask.

TASK

031-503-1002

Put on and Wear a Protective Mask

CONDITIONS

Wearing a protective mask carrier containing a prefitted M17 series protective mask and given an alarm for a surprise NBC attack, exposed to a chemical or biological attack without warning, or ordered to put on the mask.

STANDARDS

1. The protective mask is properly put on, cleared, and checked within 9 seconds after the alarm.
2. If the hood is present, it is pulled over the shoulders, zipped, and drawstrings adjusted within an additional 6 seconds. The underarm straps are secured before continuing operations.
3. The mask (and hood) are worn for at least 6 hours while performing duties.

PERFORMANCE MEASURES

1. Stop breathing.
2. Remove headgear. Open the carrier with the left hand. (Headgear may be placed between the legs or on the muzzle of a rifle held between the legs.)
3. Hold the carrier open with the left hand and with the right grasp the mask just below the eyepieces and remove the mask.
4. Grasp the facepiece with both hands, sliding the thumbs up inside so that the facepiece is opened to the fullest extent.

5. Place chin in chin pocket, then pull the head harness over the head making sure that all head straps are straight and the head pad is centered.

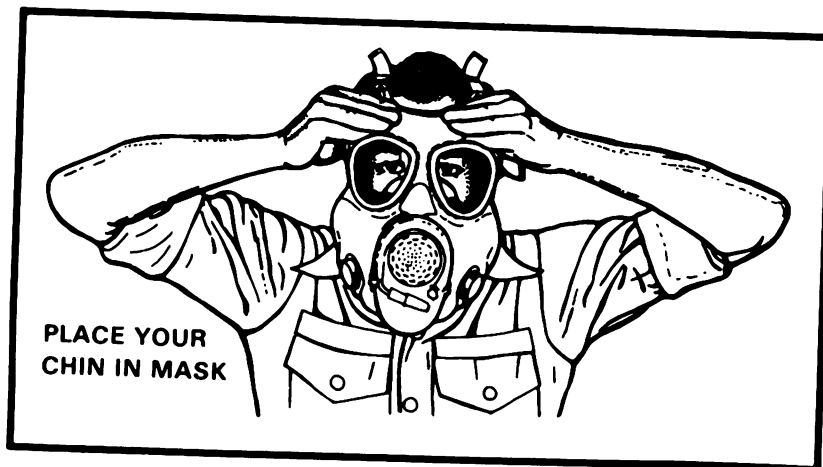


Figure 1. Step 1.

6. Smooth the edges of the facepiece on the face with an upward and backward motion of hands, pressing out all bulges to get an airtight seal.



Figure 2. Step 2.

7. To clear any gas from the mask, cup the heel of your hand over the outlet valve and blow hard. (For the M17A1 you must also place the other hand over the voicemitter.)

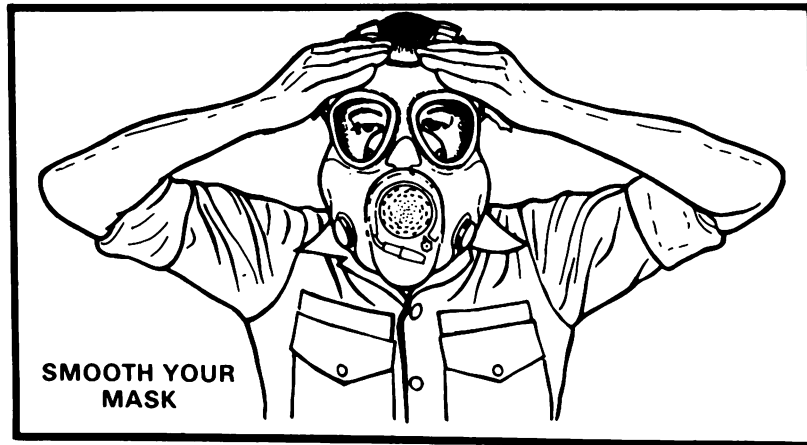


Figure 3. Step 3.

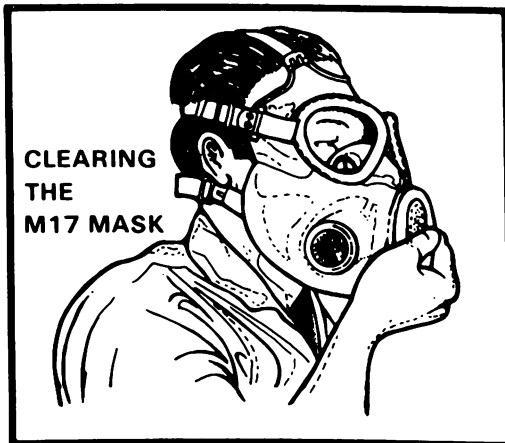


Figure 4. Step 4 for M17 mask.

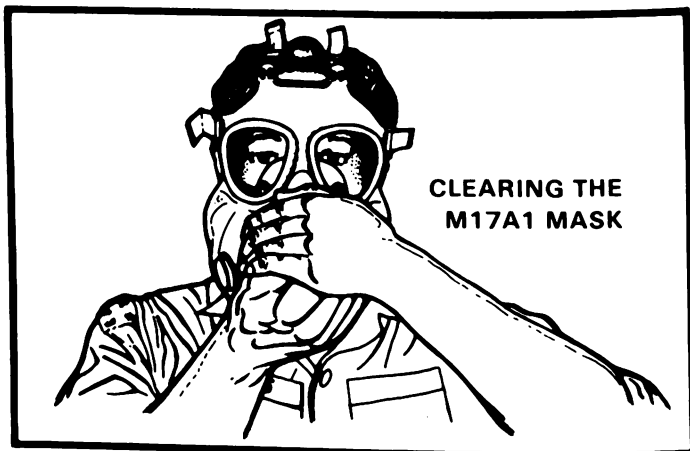


Figure 5. Step 4 for M17A1 mask.

8. Check for leaks by placing the palms of your hands over the inlet valve caps, breathing in lightly, and holding your breath. If there are no leaks, the mask should suck in toward your face and stay that way until you breathe out.

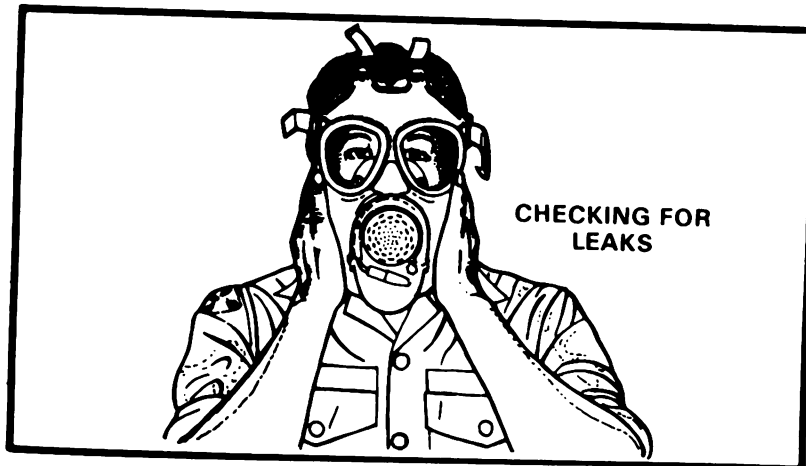


Figure 6. Step 5.

9. If you have a protective hood, pull it over the shoulders, zip it, and adjust the drawstring.
10. Replace the headgear.
11. Give the alarm (task 031-503-1006) and continue the mission. (If you have a protective hood, secure the straps under the arms before continuing the mission.)

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app D, p D-1.

FM 21-41, Individual NBC Defense, Oct 77, pp 25 thru 27.

TEC Lesson 931-061-0060-F, NBC: The Mask.

TEC Lesson 931-061-0061-F, NBC: Masking and When to Do It.

TASK

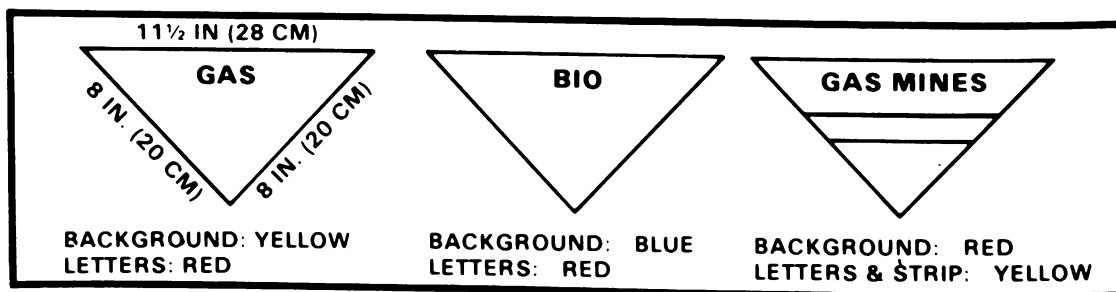
031-503-1004

Recognize and Protect Self Against a CB Hazard

CONDITIONS

Given all standard protective equipment and any one of the following indicators of a CB hazard:

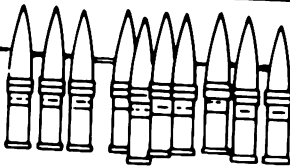
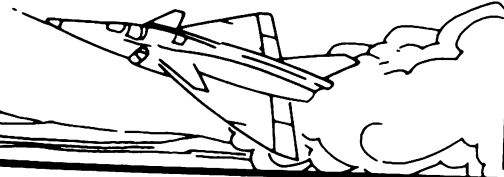



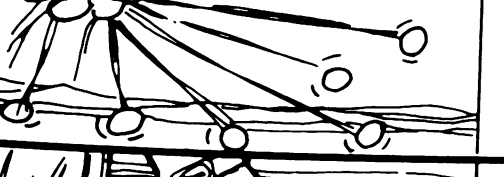

1. Contamination markers.



NOTE: The front surface of the marker is facing away from the contaminated area.

2. Any artillery, mortar, rocket, or aircraft attack near your position.
3. Any smoke, mist, vapor, or droplets from an unknown source are in the area.
4. Explosions.
5. A standard alarm; e.g., a metal-on-metal (clanging) sound, a shout of "GAS" or "SPRAY," the automatic chemical agent alarm which sounds similar to a police siren.

6. Detection of a chemical or biological delivery method

	<p>SHELLS-that explode less powerfully than HE rounds.</p>
	<p>AIRCRAFT SPRAYING-a mist or fog.</p>
	<p>VECTORS-insects that are new in your area, or large swarms of insects.</p>
	<p>AERIAL BOMBS-bombs or containers that contain bomblets pop rather than explode and cause only minor damage</p>
	<p>AEROSOL GENERATORS-any kind of device that is spraying a mist or fog.</p>
	<p>GUIDED MISSILES AND ROCKETS-bomblets that seem to have little immediate effect.</p>
	<p>MISCELLANEOUS-many people sick for no known reason.</p>

7. Any of the following symptoms appear:
 - a. Running nose.
 - b. Choking and/or tightness in the chest and throat.
 - c. Dimming of vision or difficulty in focusing.
 - d. Irritation of the eyes.
 - e. Increase in breathing rate and/or difficulty in breathing.
 - f. Stinging sensation.
8. Any suspicious actions.

STANDARDS

1. Individual is protected by putting on the mask and securing openings in clothing.
2. All personnel are alerted to the danger.

PERFORMANCE MEASURES

1. Mask as described in task 031-503-1002.
2. Secure all openings in your clothing.
3. Sound the alarm as described in task 031-503-1006.
4. If the mission permits, seek overhead cover.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 1, pp 1-10 thru 1-18; chap 5, pp 5-2, 5-3.

FM 21-41, Individual NBC Defense, Oct 77, pp 7, 8, 13-17.

SQT ADMINISTRATIVE INSTRUCTIONS

An on-target chemical agent attack can be simulated using the Simulator Projectile Airburst Liquid (SPAL) M9 or a spray of water combined with the detonation of artillery simulators.

TASK

031-503-1005

Recognize and Protect Self Against a Nuclear Hazard

CONDITIONS

Given a sudden, unwarned nuclear detonation, a warning that a nuclear attack is imminent, or the presence of a standard NATO radiological contamination marker.

STANDARDS

1. Immediately protect yourself from the initial effects by falling to the ground or,
2. Quickly take the best available cover or,
3. Recognize the marker and inform your supervisor.

PERFORMANCE MEASURES

1. When Subjected to an Unexpected Nuclear Attack:

NOTE: A nuclear burst can be recognized by the great amount of heat, light, and blast produced and the mushroom-shaped cloud that forms following the explosion.

- a. Close your eyes and drop down inside an armored vehicle or fall face down to the ground immediately, your head in the opposite direction of the detonation.

NOTE: If you have a choice between falling directly on the ground or taking two steps and jumping into a ditch, you must fall directly on the ground. In the time it takes to go those two extra steps, you can sustain serious injury.

SKILL LEVEL 1

- b. Cover all exposed portions of the skin (e.g., hands under your body, your face down, your shoulders forward to cover the back of your neck, and your helmet on).
 - c. Remain down until the blast wave passes over you and the debris stops falling.
 - d. Check for injury or damage to weapons and equipment.
2. When Warned of an Imminent Nuclear Attack:
- a. Place yourself in best protective position possible.

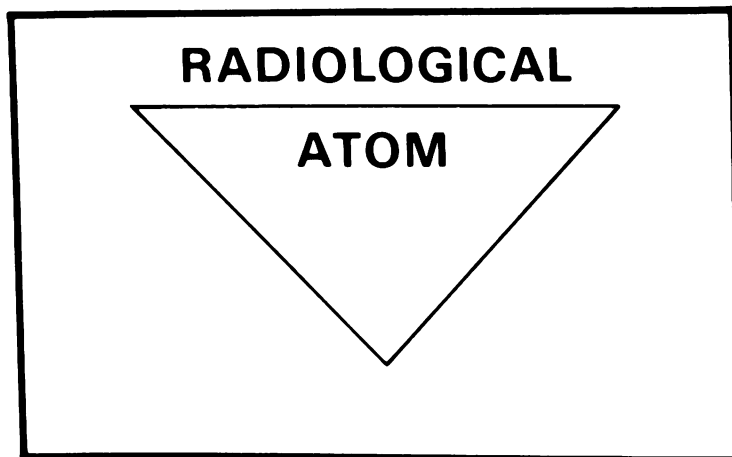


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SKILL LEVEL 1

NOTE: An armored vehicle is excellent protection.

- b. Remain in the shelter until the blast wave passes over you and debris stops falling.
 - c. Check for injury or damage to weapons and equipment.
3. Standard NATO Markers. When you encounter a standard NATO radiological contamination marker, notify your supervisor.



REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 2, pp 1-5 thru 1-7; chap 3, p 3-2.

TASK**031-503-1006****Give Visual, Vocal, and/or Sound Alarms for Chemical or Biological Attack****CONDITIONS**

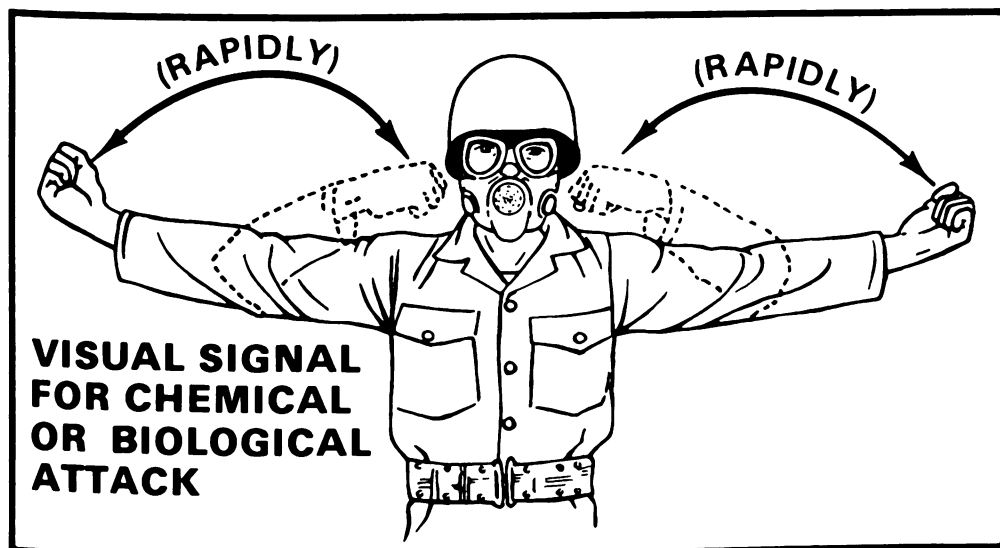
In a field environment, wearing all individual combat equipment, masked, and exposed to a surprise chemical or biological attack.

STANDARDS

The signal or signals used are performed correctly.

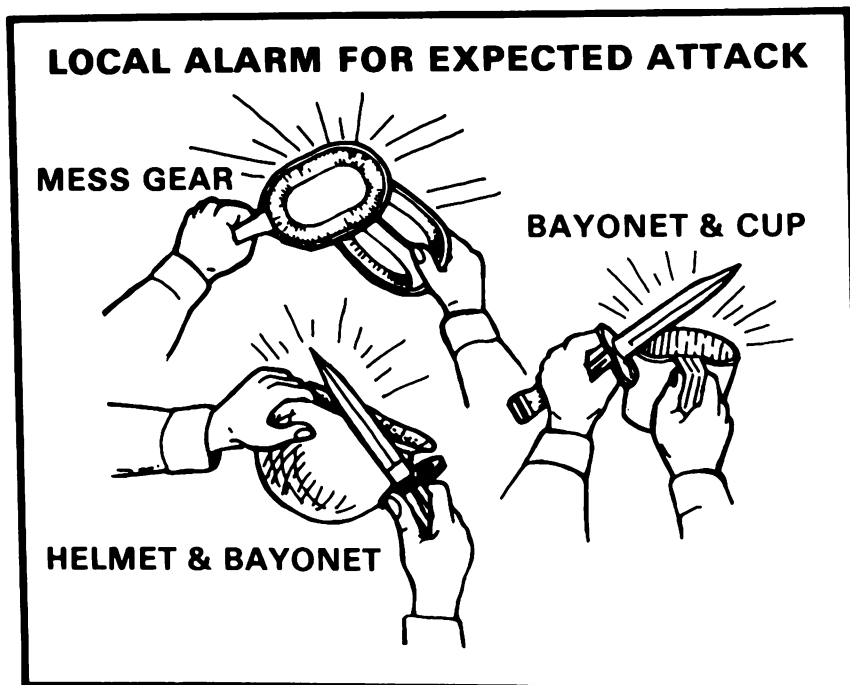
PERFORMANCE MEASURES

1. Determine the most appropriate signal or signals to use.
2. Give the signal or signals.
 - a. Visual Signal. Extend both arms horizontally sideways with fists doubled, facing up, and rapidly move the fists to the head and back to the horizontal position. Repeat at least three times.



SKILL LEVEL 1

- b. Vocal Signal. Yell "SPRAY" for a chemical or biological spray attack and "GAS" for an attack by any other means.
- c. Sound Alarm. Rapidly strike metal-on-metal to produce a loud clanging noise.



REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 6, p 6-7.

FM 21-60, Visual Signals, Dec 74, chap 2, p 2-1.

TASK**031-503-1007****Decontaminate Self****CONDITIONS**

Given all standard NBC protective equipment, the M13 and M258 decontamination kits, and contamination on the skin. (Contamination normally would result from exposure to a direct chemical attack or passage through a chemically contaminated area.)

STANDARDS

All contamination on the skin is properly removed.

PERFORMANCE MEASURES

1. If you are not already masked, mask according to task 031-503-1002.
2. If the situation permits, seek cover.
3. For contamination on your face:
 - a. Extract the M31 kit from your protective mask carrier.
 - b. Take the fuller's earth pad (skin pad) from the M13 kit.
 - c. Close your eyes, grasp the chin portion of your mask and pull the mask away from your face far enough to allow you to touch the fuller's earth pad to your nose.
 - d. Make two quick wipes from your nose across the lower portion of your face to each ear and one wipe across the chin.
 - e. Replace the mask on your face.

- f. Clear your mask.
 - g. Check your mask.
 - h. Dispose of the pad.
 - i. If contamination was only on your face, put on all protective clothing not already on.
4. For contamination on your skin:
- a. Grasp your M258 kit (fig 1) carried on the belt of your protective mask carrier.



Figure 1

- b. Open the kit (fig 2).

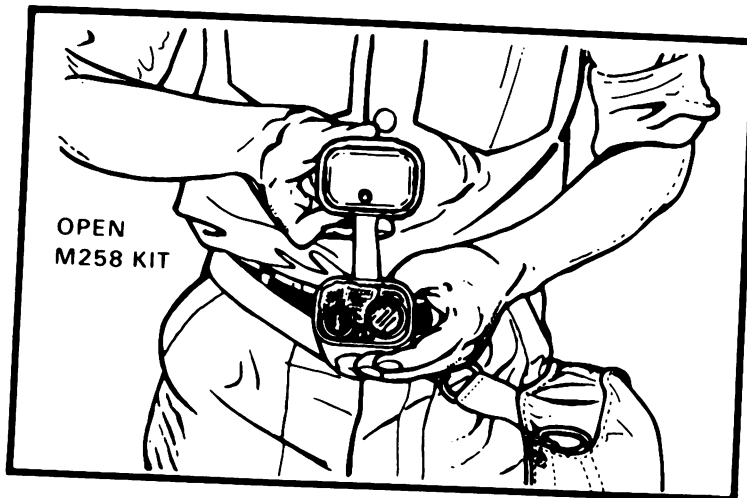


Figure 2

- c. Take out a piece of gauze and soak up any liquid on your skin. DO NOT WIPE. If the liquid is thick and won't soak into the gauze, use one of the sticks as a spoon to remove it.
- d. Take out capsule 1 and punch a hole in the side near the bottom of the capsule with the spike attached to the cover of the kit.
- e. Wet a gauze pad (fig 3) with the solution from the capsule and wipe (fig 4) off the remaining sticky material.

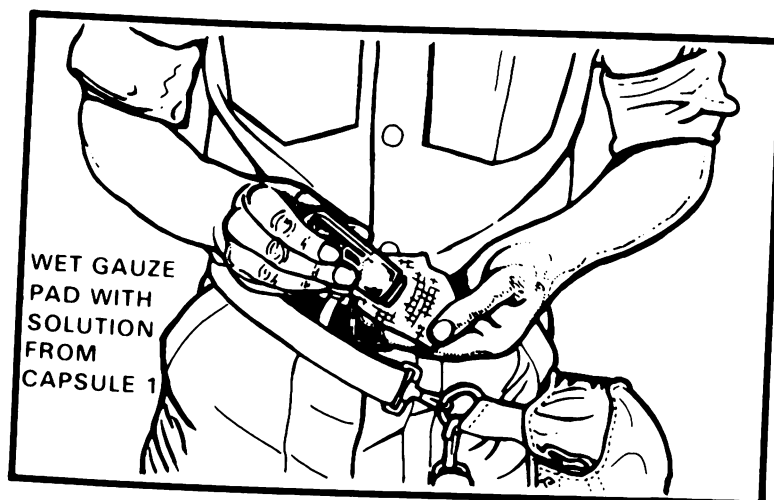


Figure 3

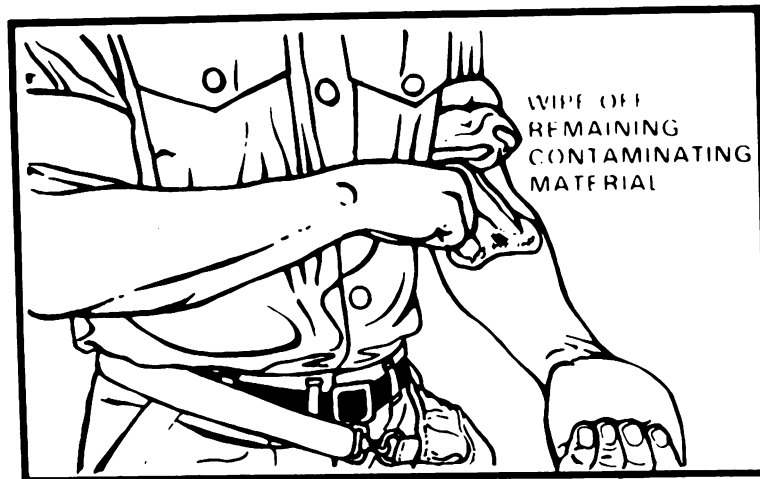


Figure 4

- f. Dispose of the pad.
- g. Take out capsule 2 and break the glass vial inside the capsule on a hard, blunt edge such as your boot heel (fig 5).

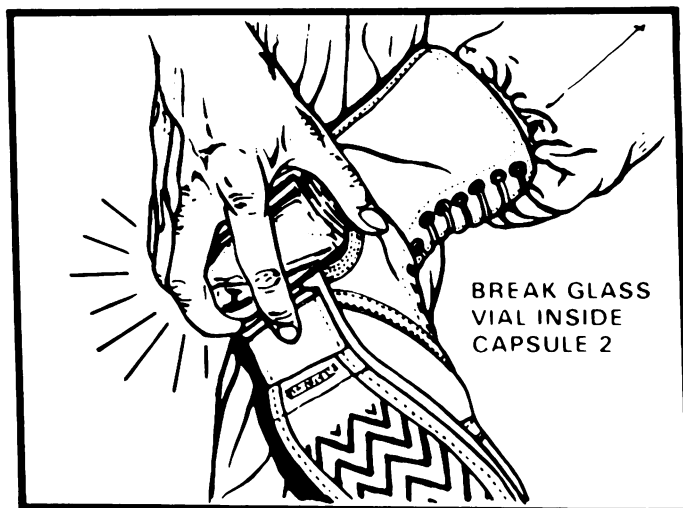


Figure 5

- h. Shake the capsule hard at least 12 times so that everything is well mixed.
- i. Puncture capsule 2 the same way you did capsule 1.

SKILL LEVEL 1

- j. Wet a gauze pad with the solution from the capsule, blot the contaminated area with the solution, and make sure you cover the entire contaminated area.
- k. Dispose of the pad.
- l. Put on all protective clothing not already on.

REFERENCES

FM 21-41, Individual NBC Defense, Oct 77, pp 58-64

QRT ADMINISTRATIVE INSTRUCTIONS

The M58 training kit will be used in all training situations. The M258 kit will be used only for actual chemical agents.

TASK

031-503-1008

Decontaminate Individual Equipment

CONDITIONS

After being exposed to a chemical agent attack, passing through an area contaminated with an agent or operating in an area contaminated with a chemical agent, wearing all protective clothing, given an M13 individual decontaminating and reimpregnating kit.

STANDARDS

Contamination is removed to the extent that the chemical agent detector kit will indicate a safe level.

PERFORMANCE MEASURES

1. Extract the M13 kit (fig 1) from the protective mask carrier.
2. Remove the fuller's earth pad and, if required, decontaminate the interior surface of your protective mask by:
 - a. Blotting the contamination with one side of the pad.
 - b. Turning the pad over.
 - c. Slapping the pad against the mask to spread the powder.
 - d. Rubbing the powder in, using the pad.
3. Remove the cloth bag and use it to decontaminate the exterior of the mask, clothing, and individual equipment by:
 - a. Crushing dye capsule and mixing thoroughly inside the bag.

NOTE: Do not crush the dye capsule unless actual contamination is present.

- b. Dusting the contaminated area.
- c. Inspecting clothing for red or brown color.
- d. Noting if red or brown color is present. If present, the cutter is used to remove spots larger than one-eighth inch.

NOTE: This does not apply to the overgarment which has an inner liner of charcoal to neutralize the contamination.

- e. Rubbing the powder on equipment when using the bag.
- f. Cleaning and oiling metal equipment.

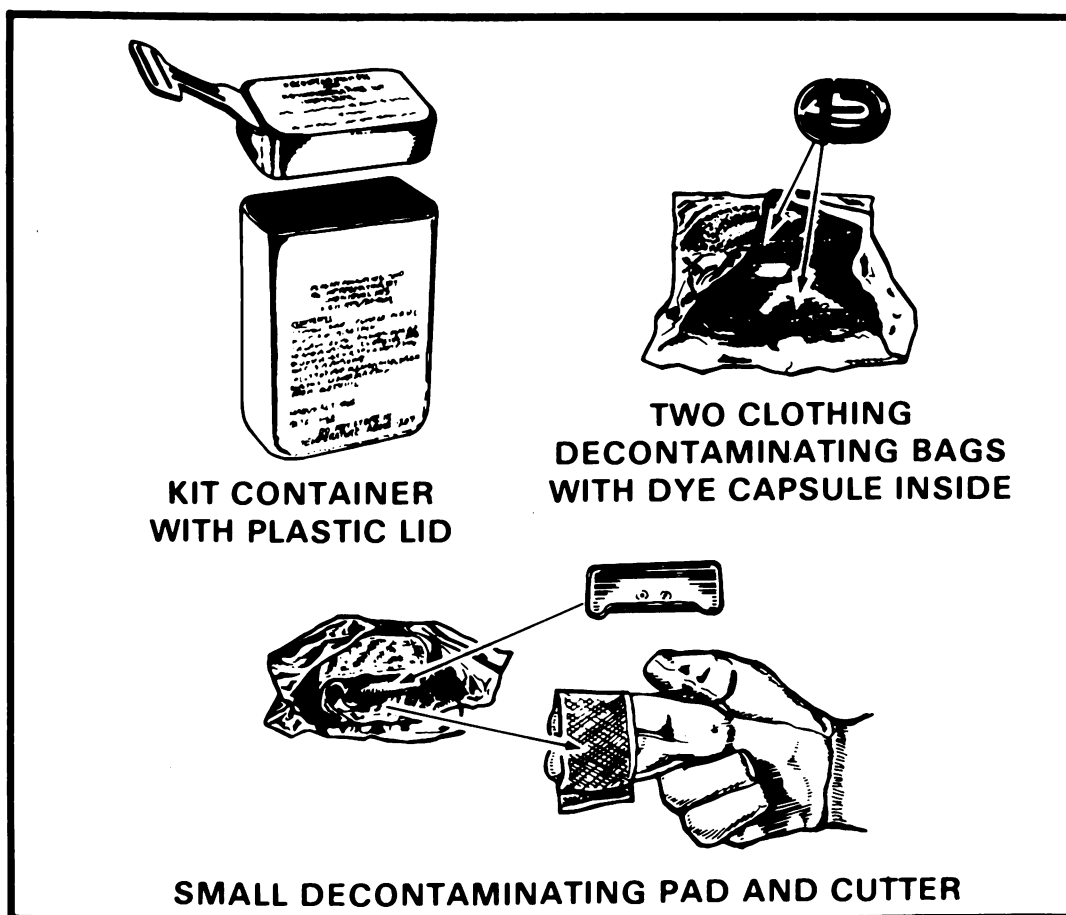


Figure 1. M13 kit.

SKILL LEVEL 1

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app B, pp B-7 and B-9.

FM 21-41, Individual NBC Defense, Oct 77, pp 65, 66.

SQT ADMINISTRATIVE INSTRUCTIONS

That portion of the procedure which requires crushing of the dye capsule will be simulated. Only in the event of an actual chemical contamination will the capsule be crushed.

TASK**031-503-1010****Exchange Filters on an M17-Series Protective Mask****CONDITIONS**

Given an M17-series protective mask with filters that have been immersed in water, or damaged, or the initiation of chemical warfare, and a pair of M13 series replacement filters.

STANDARDS

1. Filters have been replaced. After replacement due to initiation of chemical warfare, the filters are replaced at least once every 30 days.
2. Mask has been reassembled properly as indicated by the function check (see para 3 in performance measures). If a difficulty exists the supervisor is notified.

PERFORMANCE MEASURES

1. Remove the filter elements (steps 1 thru 6).

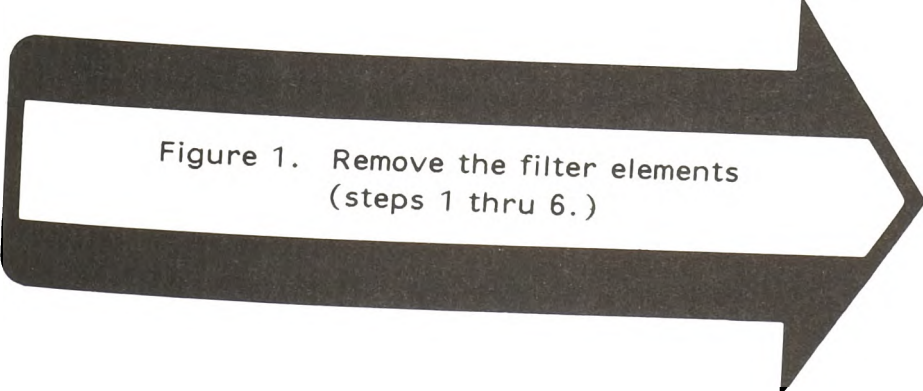
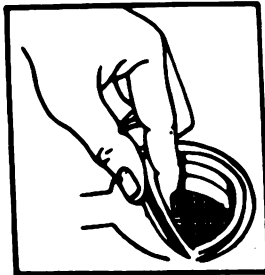


Figure 1. Remove the filter elements
(steps 1 thru 6.)

1 REMOVE INLET VALVES BY PUSHING UP ON BOTTOM EDGE OF VALVE FLANGE WITH THUMBS

2 WORK COLLAR FROM UNDER FILTER ELEMENT CONNECTOR FLANGE



3 REVERSE HEAD HARNESS BY LENGTHENING ALL STRAPS AND LOOPING HARNESS OVER FRONT OF MASK. TO AVOID DISTORTION, DON'T PULL PAD BELOW LENSES.

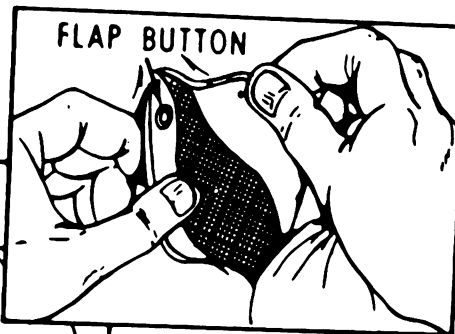
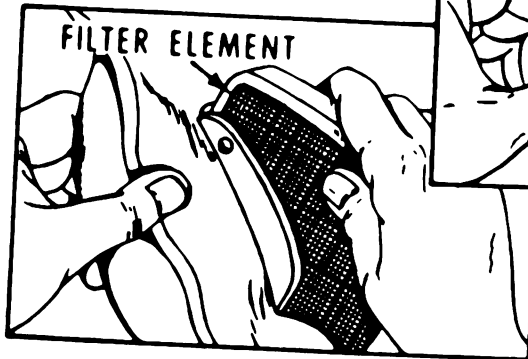


4 UNBUTTON NOSE CUP FROM FLAP BUTTON

NOTE:

TO AVOID TEARS, DON'T STRETCH RUBBER ANY MORE THAN NECESSARY TO REMOVE OR INSTALL MASK COMPONENTS.

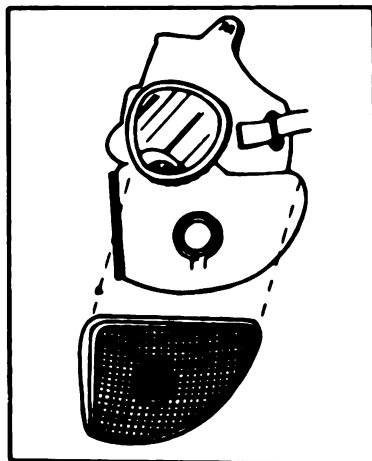
- 5 UNBUTTON TOP POUCH FLAP FROM BOTH FLAP BUTTONS. UNBUTTON BOTH SIDES OF MASK BEFORE PROCEEDING.**



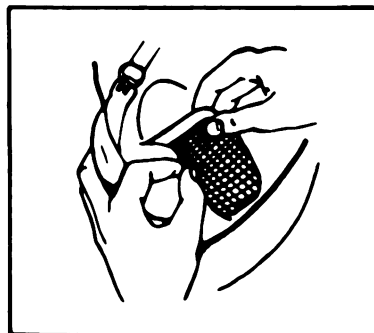
- 6 GRASP UPPER PART OF ONE FILTER ELEMENT BETWEEN FINGERS AND THUMB. GRASP OUTSIDE OF FACEPIECE BETWEEN VOICEMITTER-OUTLET VALVE ASSEMBLY AND CONNECTOR WITH OTHER HAND. PULL FILTER ELEMENT FROM MASK. REMOVE SECOND FILTER IN SAME MANNER.**

Replace the filter elements (steps 7 thru 10 and steps 11 thru 16).

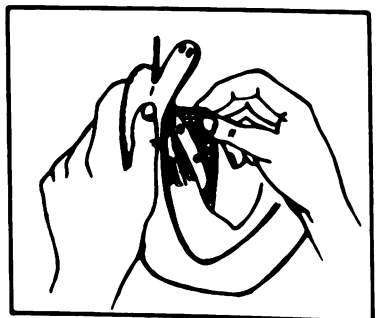
- a. The word TOP on rim of inlet valve should be centered above the louvers inside the valve. To check position of the louvers, hold valve, with mesh side facing you, to a light source. Light spaces between louvers should diminish and disappear when bottom of valve is tilted toward light source. (If winterizing valve disks have been installed, they must be removed before light can be seen through louvers.) If word TOP is not centered or is missing, rotate valve until louvers are horizontal. Mark rim at point of top center with a dot of white paint. Reinstall disks if removed.
- b. Position valve over one side of connector with word TOP (if correctly located) or dot toward top of mask. Snap valve into place. Repeat for other valve.



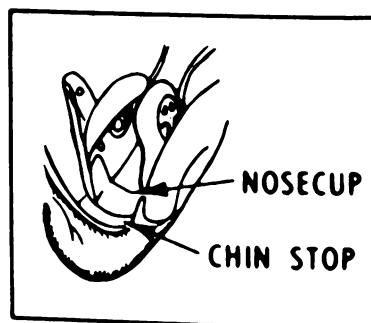
- 7** FILTER ELEMENTS ARE MARKED EITHER RIGHT OR LEFT. ALIGN FILTER ELEMENTS WITH OUTSIDE CONTOURS OF CHEEK POUCHES TO BE SURE YOU'RE INSTALLING THEM CORRECTLY.



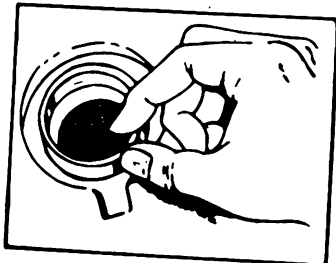
- 8** HOLD FILTER ELEMENT BY SQUARE CORNER WITH YOUR FINGERS ON CONNECTOR SIDE. PULL LOWER POUCH FLAP OUTWARD JUST ENOUGH TO OPEN CHEEK POUCH. INSERT CURVED EDGE OF ELEMENT INTO POUCH WITH A SLIGHT TURNING MOTION, PUSH ELEMENT UP INTO POUCH.



- 9** GRASP CORNER OF ELEMENT FIRST INSERTED INTO MASK AND WORK ELEMENT INTO PLACE.



- 10** ALLOW NOSECUP AND POUCH FLAPS TO FALL INTO NORMAL POSITION. CHECK THAT BOTTOM OF NOSECUP LIES ON TOP OF CHIN STOP SO MOIST EXHALED AIR DOESN'T ENTER POUCHES AND DAMAGE FILTER ELEMENTS.



- 11** WORK COLLAR UNDER CONNECTOR FLANGE AND RECHECK FILTER ELEMENT POSITION. ADJUST IF NECESSARY.

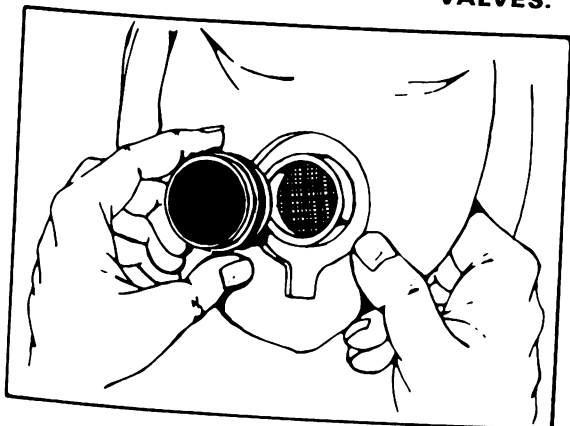


- 12** AFTER BOTH ELEMENTS ARE INSTALLED, BUTTON POUCH FLAPS AND NOSECUP. PLACE ONE FINGER UNDER SHORT (OUTER) BUTTON AND SLIP CORRESPONDING HOLE IN FLAP OVER THAT BUTTON. REPEAT WITH LONG (INNER) BUTTON.

- 13** SLIP HOLE IN NOSECUP OVER INNER BUTTON.

- 14** BUTTON BOTH SIDES IN LIKE MANNER.

- 15** RETURN HEAD HARNESS TO NORMAL POSITION AND ADJUST STRAPS AS REQUIRED TO INSTALL INLET VALVES.



- 16** INSTALL INLET VALVES.

3. Perform a function test.
 - a. Put on the mask.
 - b. Clear the mask.
 - c. Check the seal.
 - d. If you cannot obtain a seal or cannot breathe, check to see if the mask has been reassembled properly.
 - e. If the difficulty still exists, notify your supervisor.

REFERENCES

TM 3-4240-279-10, Operator's Manual: Mask, Chemical-Biological: Field, ABC-M17/M17A1 and Accessories, Aug 75, chap 3, sec III, pp 3-6 thru 3-8 w/C1.

TASK**031-503-1014**

Identify a Chemical Agent Using ABC-M8 Detector Paper

CONDITIONS

Wearing a protective mask and gloves, and given an unknown liquid which may be a chemical agent and a book of ABC-M8 detector paper.

STANDARDS

Within 1 minute, determine if the unknown liquid is a nerve (V or G) or blister (H) agent.

PERFORMANCE MEASURES

1. Extract the book of ABC-M8 paper which is normally found in the protective mask carrier.
2. Remove the book of detector paper from the wrapping.
3. Tear out one sheet of paper.
4. Touch paper to the unknown liquid.
5. Try to match the color reaction on the paper to the color chart on the inside cover of the book.
6. Inform your supervisor of your findings. Continue to wear your mask, even if you don't get a match as this is no indication that the substance is necessarily safe.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app B, p B-11.

TASK

031-503-1015

Put on and Wear Protective Clothing

CONDITIONS

In field or garrison, unassisted, given either the chemical protective overgarment or protective liner ensemble and one pair of socks and gloves.

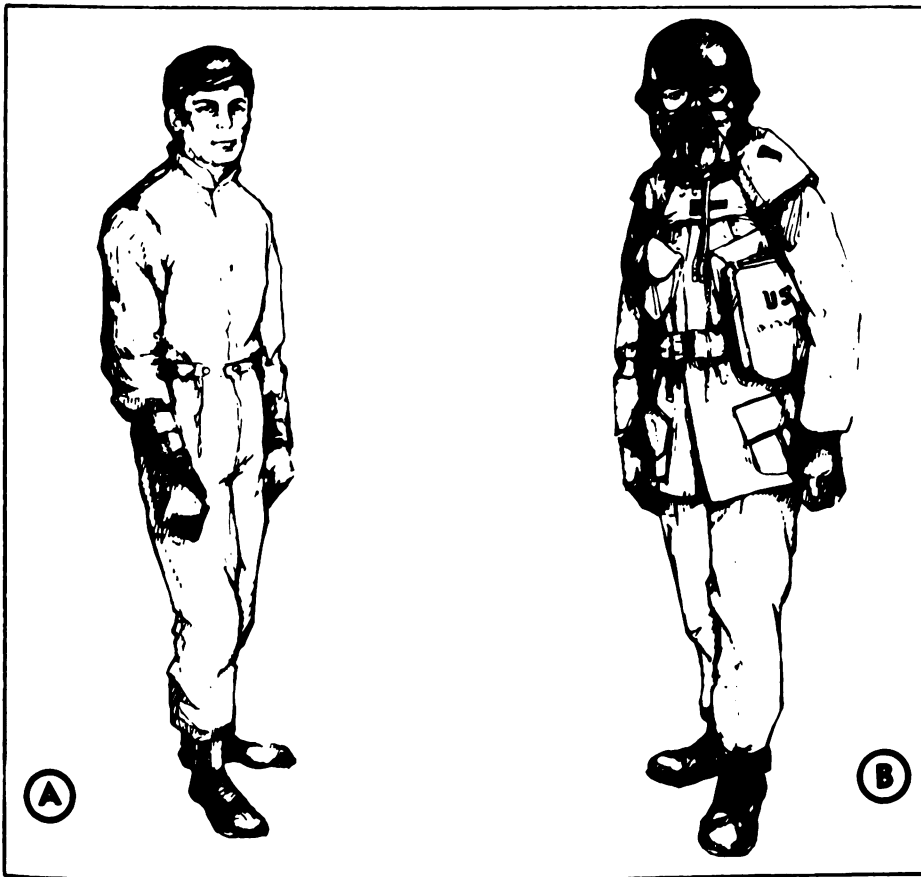
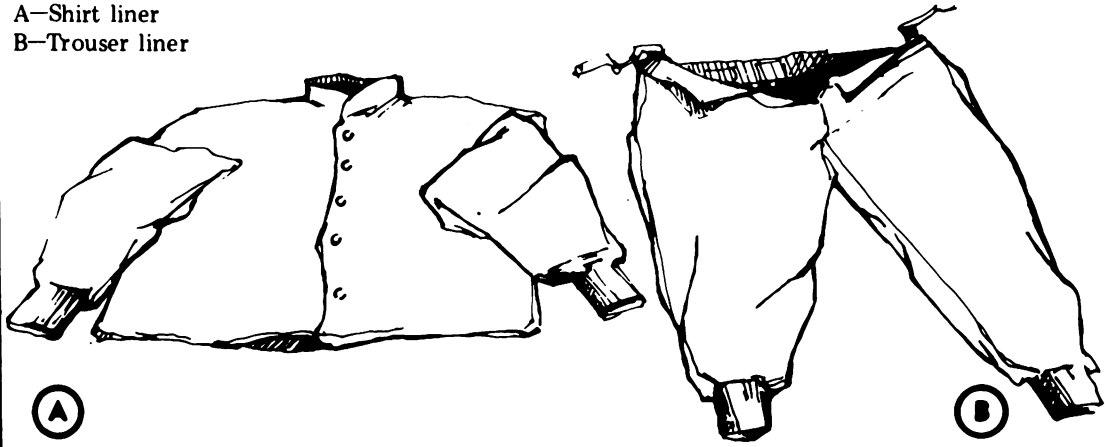
STANDARDS

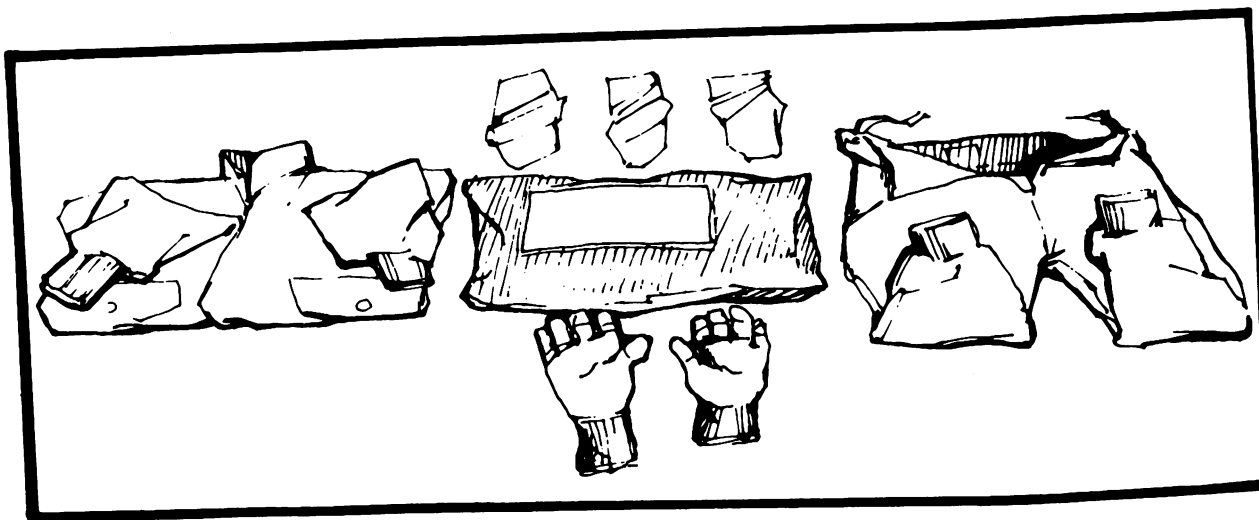
1. Clothing is put on properly; e.g., all closures fastened and no skin exposed.
2. Dressing is completed within 3 minutes.
3. Protective clothing is worn for at least 6 hours while performing your duties.

PERFORMANCE MEASURES

1. Procedure For Putting on Overgarment.
 - a. Remove boots.
 - b. Replace boot socks with impregnated socks.
 - c. Put on boots and tuck trouser cuffs in boots; lace tightly.
 - d. Put on overgarment trousers, zip legs, and tie firmly; blouse over boots.
 - e. Put on overgarment shirt, zip up, and fasten closures.
 - f. Put on protective gloves and pull the cuff of the overgarment over the gloves.

A—Shirt liner
B—Trouser liner





2. Procedure for Putting on Liner Ensemble.

- a. Put on trouser liner.
- b. Put on outer trousers and attach liner waist tie tapes through belt loops of the outer trousers.
- c. Button inside gas flap button of trouser liner into right buttonhole, then button left outside of trouser liner to the same button.
- d. Put on protective socks and pull over top of the knitted cuff of the trouser liner.
- e. Put on boots and lace snugly. The upper portion of the boot must cover the top of the knitted cuff of the trouser liner and top of the sock. The cuff of the outer trousers is bloused over the top of the boot.
- f. Put on shirt liner. Button inside gas flap button into right buttonhole, then button left outside of liner to the same button.
- g. Tuck the shirttail of the liner inside the trouser liner.
- h. Put on the outer shirt, button it, and leave shirttail outside.
- i. Put on protective gloves. Pull upper portion of the glove over knitted cuff of shirt liner. Sleeves of outer shirt are pulled over the upper portion of the gloves.

3. Perform Primary Duties Wearing the Protective Clothing.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, app B, pp B-1, B-2, and B-3, Oct 77.

TM 10-277, w/C1 thru 3, Protective Clothing Chemical Operations, chap 12, sec III, para 12, Jul 67.

TASK**051-202-1001****Camouflage/Conceal Self and Individual Equipment****CONDITIONS**

During daylight, given camouflage paint stick(s), individual weapon, load-bearing equipment (LBE), helmet complete with accessories, a snowsuit (white sheet or mattress cover) if appropriate, burlap gar-nishing strips or cloth strips, charcoal or burnt cloth residue, and mud (if appropriate to area).

STANDARDS

Within 15 minutes, shade shiny areas of exposed skin with dark color and shadow areas with light color. Clothing, LBE, and weapon out-lines will be altered and irregular patterns added to blend with the predominant color of the background in the area.

PERFORMANCE MEASURES

1. Guide for skin camouflage. Exposed skin reflects light and attracts the enemy's attention. Even very dark skin will reflect light because of its natural oil. Camouflage face paint sticks are issued in three standard two-tone sticks as follows:

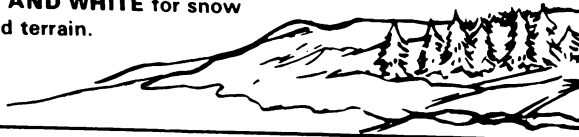
LOAM AND LIGHT GREEN for
vegetated regions.



SAND AND LIGHT GREEN for
desert and dry areas.



LOAM AND WHITE for snow
covered terrain.



LOAM AND LIGHT GREEN for vegetated regions.

SAND AND LIGHT GREEN for desert and dry areas.

LOAM AND WHITE for snow-covered terrain.

2. To camouflage exposed skin.

- a. Paint the shiny areas (forehead, cheekbones, nose, and chin) with a dark color.



(1) Slits in burlap allow insertion of natural material.



(2) Rubber bands, or expedient bands made from old inner tubes or burlap strips, secure natural materials. (Note position of band.)



(3) A disruptive paint pattern, with the pattern carried across the curved lines of the edges, especially those seen from the front.

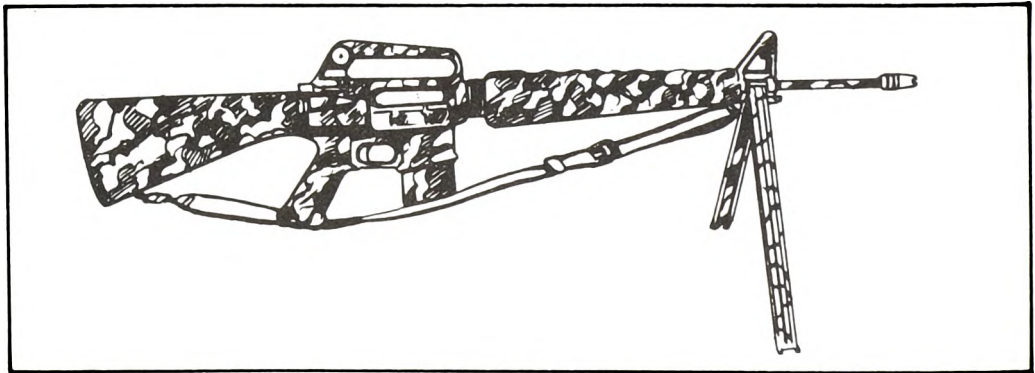
- b. Paint the shadow areas (around the eyes, under the nose, and under the chin) with a light color.
- c. Paint the exposed skin on the back of your neck and hands with irregular patterns.
- d. When applying camouflage, use the buddy system--work with another person and check each other.

3. To camouflage the helmet.

- a. The outline of the helmet is one of the striking features of your equipment, and its curved shape can be easily identified by the enemy. You should attempt to break up the outline of your helmet. There are several ways of doing this.
- b. Improvised helmet covers can be made of pieces of burlap, other cloth, or sandbags.

4. To camouflage your weapon.

- a. One of the easiest ways to change the outline of your weapon is by wrapping it with burlap strips or strips of cloth dyed to match the background.
- b. Pattern painting the weapon is also good. Shiny parts can be covered by cloth, paint, or mud.
- c. Care must be taken when camouflaging a weapon not to cause interference in the sighting and firing of the weapon.



5. To camouflage your uniform:

- a. Combat uniforms can be stained and dyed with a little imagination.
 - (1) You can make a uniform blend with the terrain by dyeing it or by attaching bow ties of colored burlap.
 - (2) A mixture of mud and grease or crankcase oil may be used to stain your uniform.

- (3) When operating in snow-covered terrain, you can make a snowsuit from a sheet, mattress cover, or other white cloth.
- b. The important thing is to make the clothing look less like a uniform and more like the terrain in which it is to be worn.



6. To blend with your surroundings.

Blending is the use of camouflage materials on, over, and around an object so that it appears to be part of the background. For example, a soldier can apply stick paint to exposed skin, and add burlap, paint, and live vegetation to helmet, clothing, and LBE so that it will closely resemble or blend into the background.

REFERENCES

FM 5-20, Camouflage, May 68.

TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part 1.

TASK

051-202-1002

Camouflage/Conceal Equipment

CONDITIONS

During daylight, given an item(s) of military equipment in a field location, natural camouflage materials (foliage, grass, mud, snow, etc.) appropriate to area, camouflage net(s), and basic issue pioneer equipment.

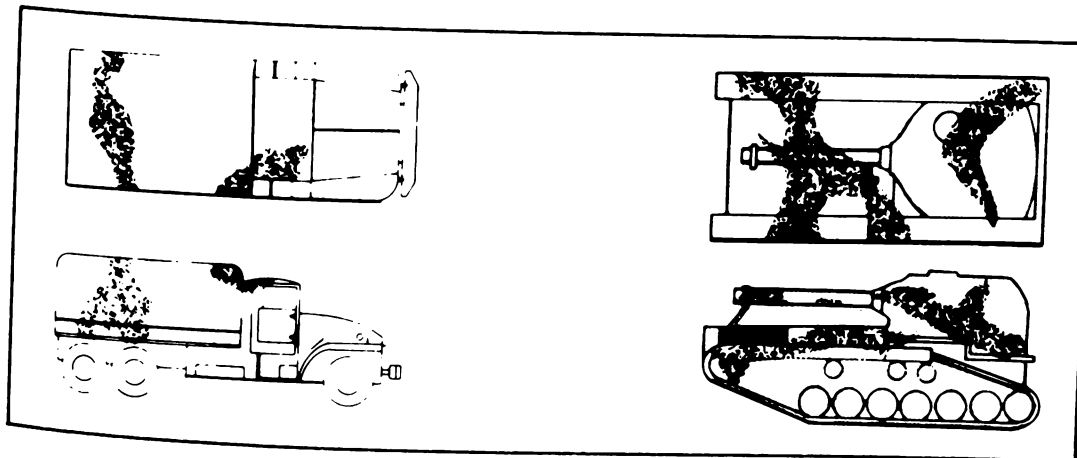
STANDARDS

Conceal shiny parts and cover remaining areas of the equipment in irregular patterns, and alter outlines to blend with the predominant terrain background pattern in the area.

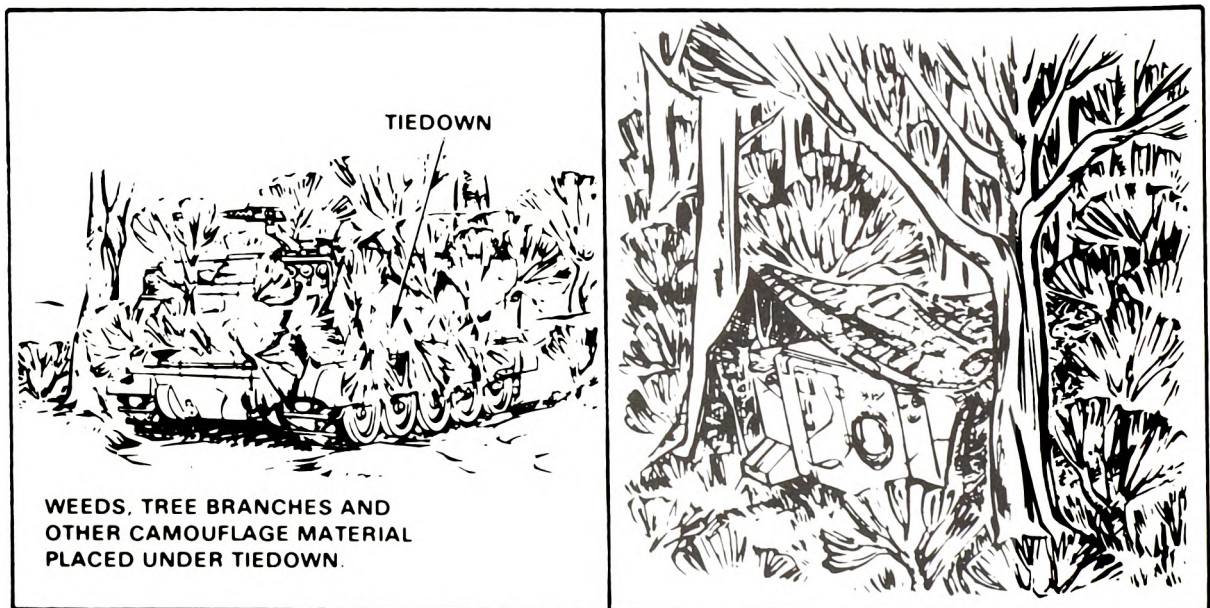
PERFORMANCE MEASURES

To camouflage and conceal equipment, follow these examples:

1. Use pattern paint, mud, etc., to cover shiny areas of equipment in irregular patterns so the item will blend with the color of natural surroundings.



2. Use natural materials (foliage, grass, mud, etc.) and manmade materials to alter the shape and size of the equipment.



REFERENCES

FM 5-20, Camouflage, May 68.

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77.

TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part 1.

TASK

051-202-1003

Camouflage/Conceal Defensive Positions

CONDITIONS

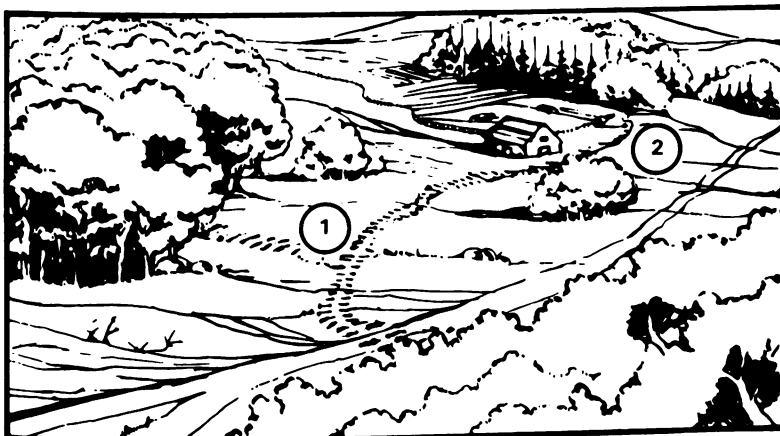
In a field location during daylight or limited visibility, given a defensive position either being built or already constructed.

STANDARDS

Completed position so blends with the terrain that an approaching soldier approximately 35 meters (hand grenade range) to the front cannot detect it.

PERFORMANCE MEASURES

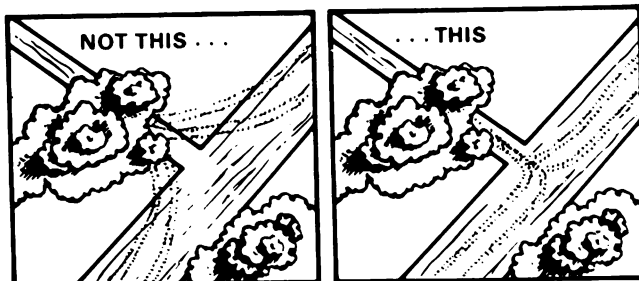
1. Before, during, and after construction of defensive position:
 - a. Approach the position only from the rear, insuring that a visible trail is not left. Circle the position when moving to the front so that a trail does not point out the position.



It is obvious here, to even the untrained observer, that some activity is taking place at both 1 and 2 and needs watching.

- b. Do not litter area, make noise, or, during hours of darkness, expose any light.
- c. Do not disturb vegetation not used in constructing or camouflaging the position. Be particularly careful with a vehicle, if you are a driver, to insure that the vehicle does not leave a trail pointing out the position.

DON'T CUT CORNERS SHORT



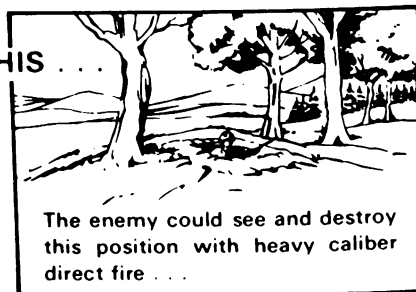
Cut corners show vehicle movement into woods.

2. During construction:

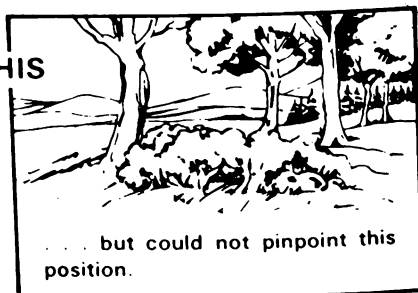
- a. Place sod from the position in front of proposed parapet location.
- b. Use soil removed from the position to build a parapet and then cover it with sod in such a manner that it looks natural and will have a good chance of growing. Conceal the dirt you dig from the fox hole by carrying it away and putting it under low bushes, on roads, or in streams and ponds. The poncho is handy for carrying soil.



NOT THIS ...



... THIS



- c. If additional vegetation must be used to break up the outline of the parapet, obtain some (similar to that found near your position) from far to the rear of your position with root structure intact, if possible. Do not use so much vegetation that the position has more than the surrounding area. Camouflage the holes or cuts from which vegetation was removed.



3. After construction:

- a. Replace dying foliage constantly. (Change cut foliage at least every 3 hours when the tactical situation permits.)
- b. If the ground under the weapon's muzzle (when aimed within sector of fire from completed position) is dusty, keep it moist but not excessively wet.
- c. Upon completion, your position should blend with the surrounding terrain to prevent detection from the front. You or your buddy should check the position from the front to insure sufficient concealment.

REFERENCES

FM 5-15, Field Fortification, Jun 72.

FM 5-34, Engineer Field Data, Sep 76.

TASK

071-311-2001

Perform Operator Maintenance on an M16A1 Rifle, Magazine, and Ammunition

CONDITIONS

Given an M16A1 rifle, magazine, 5.56-mm ammunition (combat only), and small arms maintenance equipment case (FSN 8465-00-781-9564).

STANDARDS

1. Disassemble M16A1 rifle IAW performance measures for disassembly.
2. Clean and lubricate M16A1 rifle IAW performance measures for cleaning and lubricating.
3. Assemble M16A1 rifle IAW performance measures for assembly and conduct a function check.
4. Disassemble, clean, and lubricate, then assemble rifle magazine IAW performance measures for care of the rifle magazines.

PERFORMANCE MEASURES

1. CLEAR YOUR RIFLE



Clear Your Rifle steps a thru e.

- a** Place selector on SAFE. If weapon is not cocked, lever cannot be pointed toward SAFE.



- b** Remove magazine.

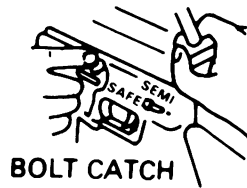
PRESS
CATCH BUTTON

PULL
MAGAZINE
DOWN



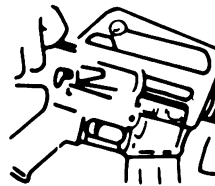
- c** To lock bolt open, pull charging handle rearward, press bottom of bolt catch, allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place on SAFE.

PULL
CHARGING HANDLE



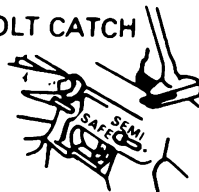
BOLT CATCH

- d** Eyeball receiver and chamber to insure these areas contain no ammo.



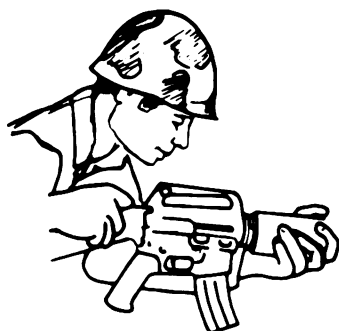
- e** With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.

BOLT CATCH

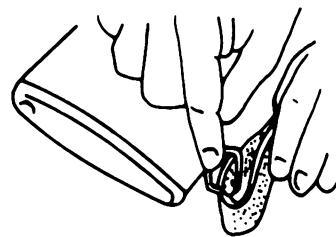


2. DISASSEMBLY

^a first CLEAR YOUR RIFLE



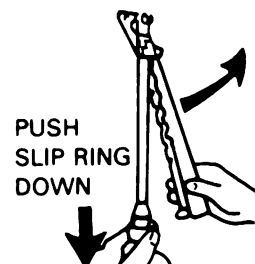
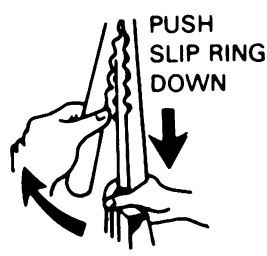
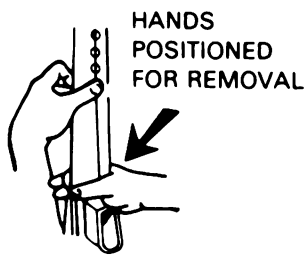
^b Remove sling.



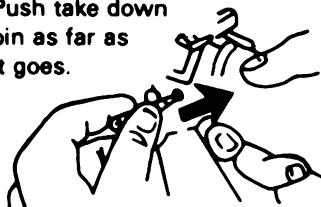
^c Remove handguards

NOTE →

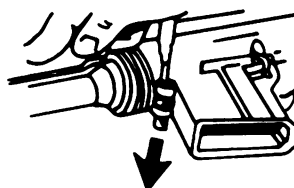
Remove & clean only if dirt & corrosion can be seen through vent holes.



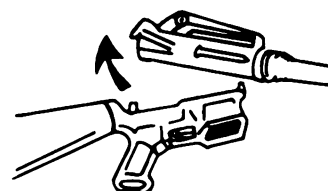
Push take down pin as far as it goes.



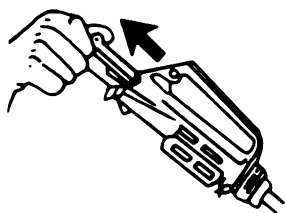
^d Pivot upper receiver from lower receiver.



^e Push receiver pivot pin.



^f Separate upper and lower receivers.

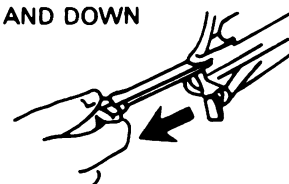


^g Pull back charging handle and bolt carrier.



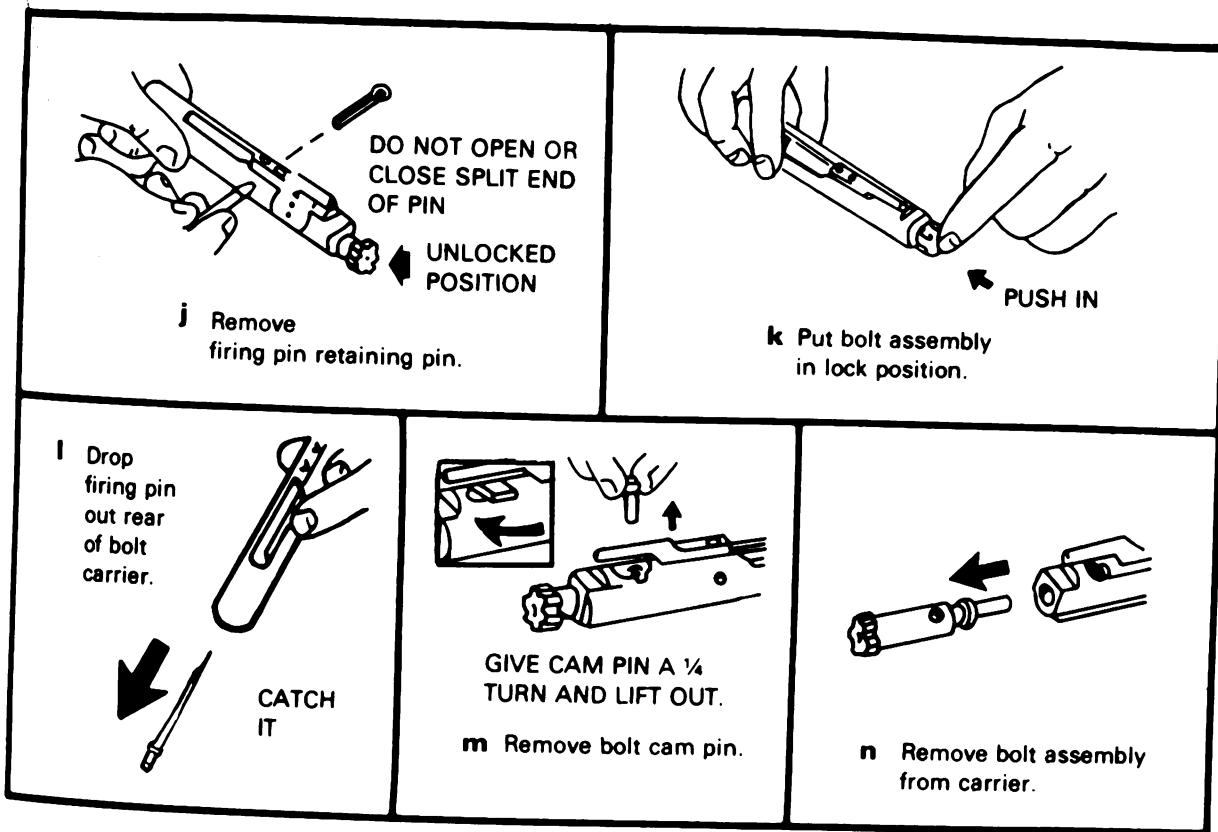
^h Remove bolt carrier and bolt.

PULL BACK AND DOWN

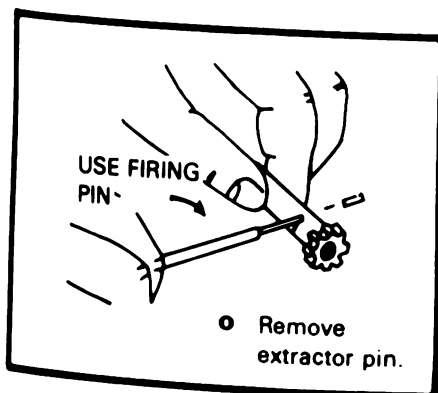


ⁱ Remove charging handle.

DISASSEMBLY (cont).



NOTE: Perform steps o thru r only when parts are dirty or damaged.

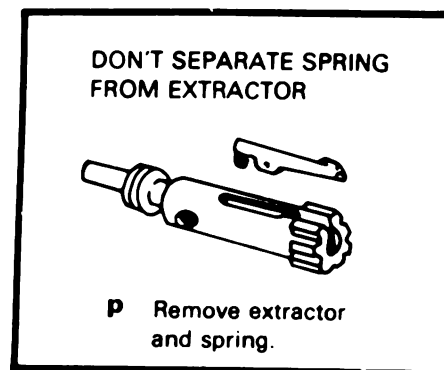


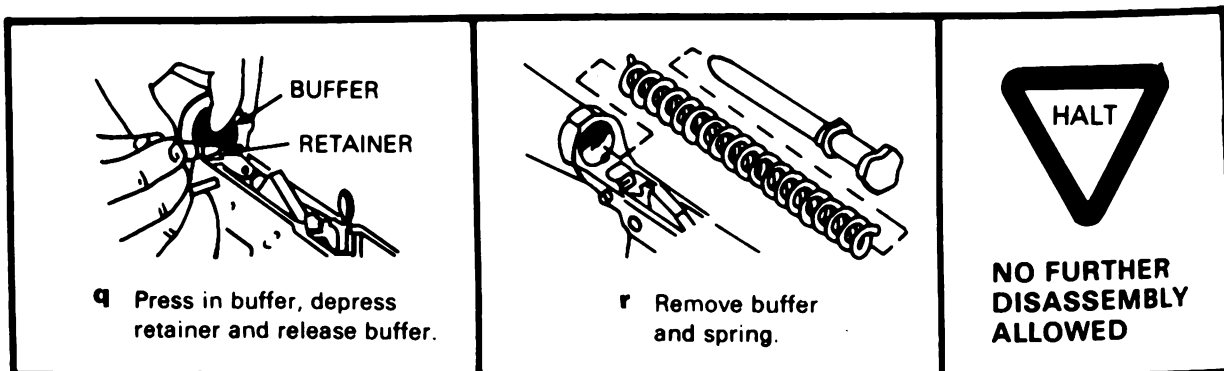
NOTE

Press top of extractor to check spring function.

See your ARMORER

Do not damage tip of firing pin.

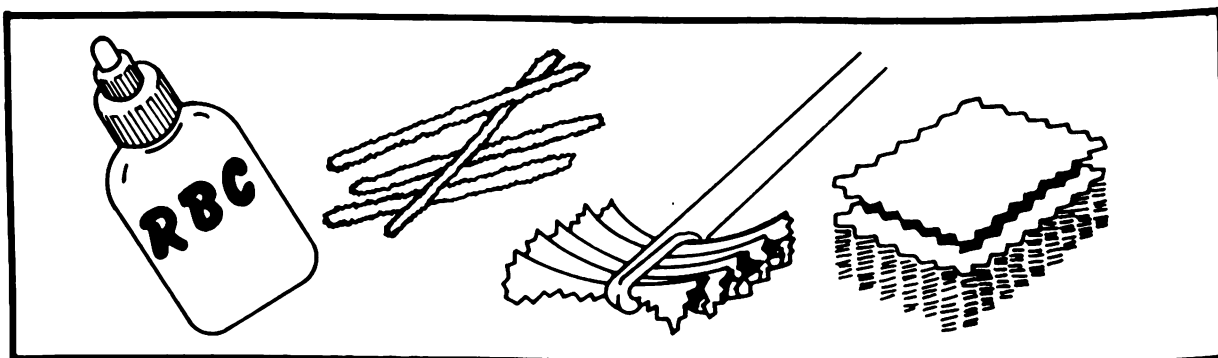




3. CLEAN . . . LUBE . . . INSPECT

With the rifle disassembled, thoroughly clean, inspect and lube, so that you have a reliable weapon you can always depend on.

- After firing, clean your weapon for 3 consecutive days with rifle bore cleaner (RBC). Wipe dry and lube according to lubrication instructions.



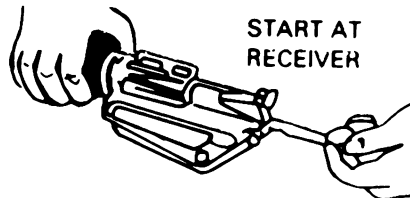
Cleaning materials: swabs, pipe cleaners, and RBC are expendable items that are available from company supply.

If any parts are missing or defective, see your ARMORER.

a. CLEANING upper and lower receiver group

CLEAN WITH RBC

- All Areas of Powder Fouling, Corrosion, Dirt & RUST
- Bore & Chamber
- Locking Lugs
- Gas Tube



START AT RECEIVER

GO RIGHT THRU THE FLASH SUPPRESSOR



BORE BRUSH (DON'T REVERSE DIRECTION WHILE IN BORE)



BARREL LOCKING LUGS AND GAS TUBE

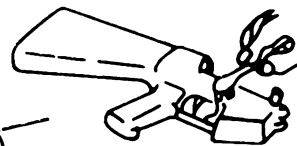
Use a worn bore brush to get outside surface of protruding gas tube (get sides and bottom from bottom of receiver)

- All Areas of Powder Fouling, Corrosion, and Dirt
- Wipe Dirt from Trigger Mechanism
- Clean Buffer and Inside Lower Receiver Extension

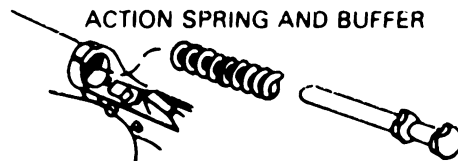
CAUTION

Do not use wire brush or any type of abrasive material to clean aluminum surfaces

PIPE CLEANER

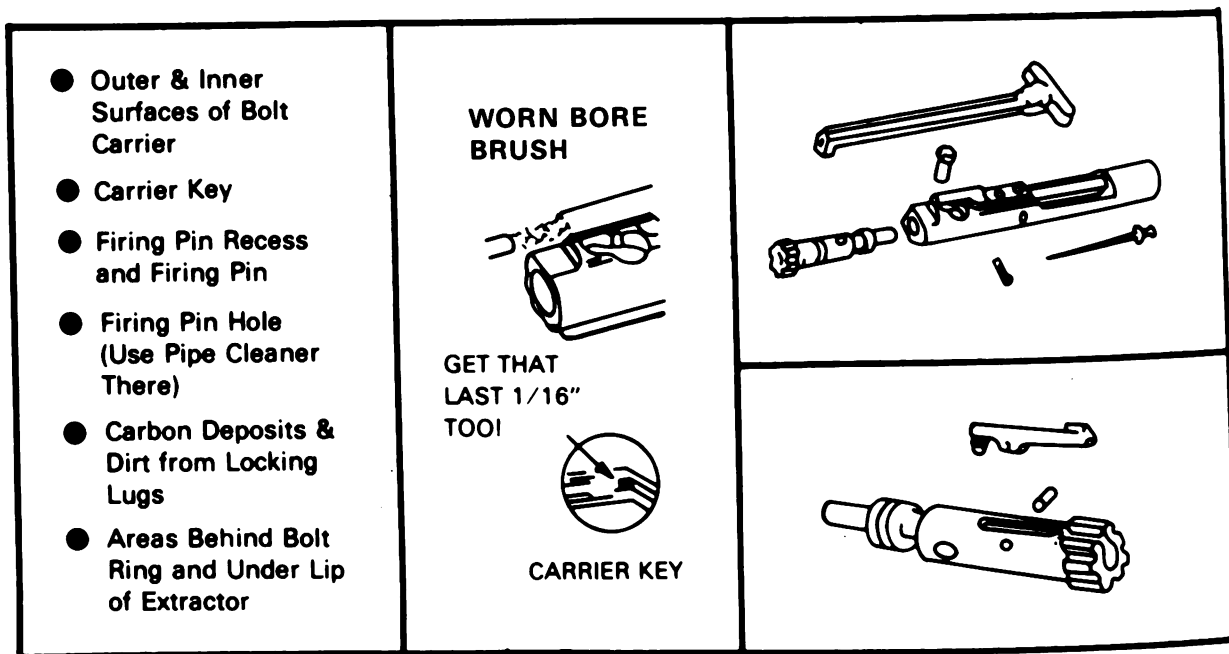


CLEAN DRAIN HOLE



ACTION SPRING AND BUFFER

b. CLEANING bolt carrier group



c. LUBRICATE

After cleaning all parts, lightly lubricate with LSA the lugs in barrel extension, bore, and chamber. Lightly lubricate the bolt carrier. Lubricate slide cam pin area, piston rings, outside bolt body, and in bolt carrier key.

CAUTION: Apply only a light coat of LSA to firing pin and firing pin recess.

Coat all other surfaces with lubricant. Apply a light coat of LSA to buffer, action spring, and inner surfaces of lower receiver extension. Use generous amount inside lower receiver and on all components.

LUBE GUIDE

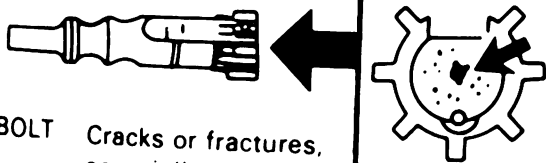
Under all but the coldest arctic conditions, LSA is the lubricant to use on your rifle. Remember to remove excessive oil from the bore before firing.

Lightly Lube - A film of oil barely visible to the eye.

Generously Lube - Heavy enough so that it can be spread with the finger.

d. INSPECT - before assembly

WARNING: DO NOT interchange bolts between rifles



BOLT Cracks or fractures, especially in the cam pin hole area. Bolts that contain pits extending into the firing pin hole need replacing



FIRING PIN - Bent, cracked or blunted end



FIRING PIN RETAINING PIN - Bent, busted, badly worn



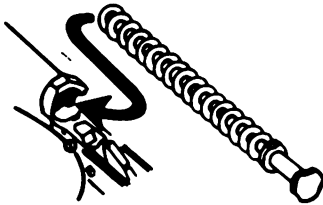
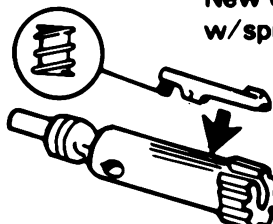

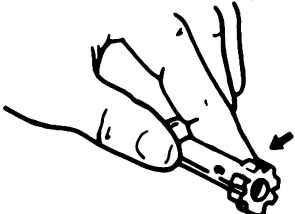
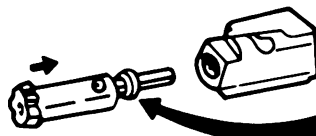
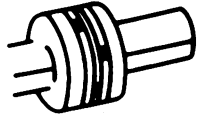
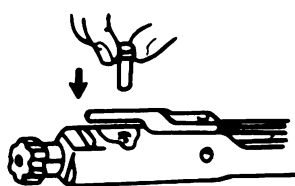


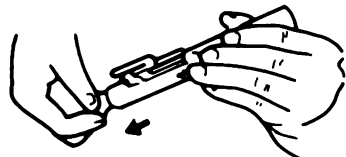
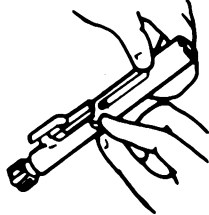
CAM PIN - Cracked, chipped or missing



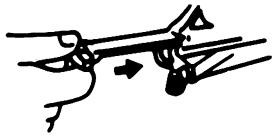
EXTRACTOR AND EXTRACTOR SPRING - Check extractor for chipped or broken edges in the area of the lip that engages the cartridge rim.

IF PARTS ARE MISSING OR DEFECTIVE, SEE YOUR ARMORER

4. ASSEMBLY

 <p>a Insert spring and buffer</p>	<p>New extractor has a silicone insert w/spring. Be sure not to lose it</p>  <p>If the spring comes loose, put the large end of spring in the extractor and seat</p>  <p>b Insert extractor and spring</p>	
 <p>c Push in extractor pin</p>	<p>WARNING Don't switch bolts between rifles</p>  <p>d Slide bolt into carrier</p> <div>  <p>STAGGER RING GAPS TO STOP GAS LOSS</p> </div>	
 <p>e Replace bolt cam pin</p>	 <p>GIVE CAM PIN A ¼ TURN AFTER ASSEMBLY</p>	<p>FIRING PIN</p>  <p>f Drop in and seat</p>
 <p>g Pull bolt back</p>	<p>NOTE</p>  <p>Firing pin should not fall out when bolt carrier group is turned upside down</p> <p>h Replace retaining pin</p>	

ASSEMBLY (cont).

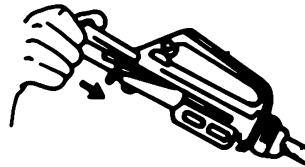


i Engage, then push charging handle part way

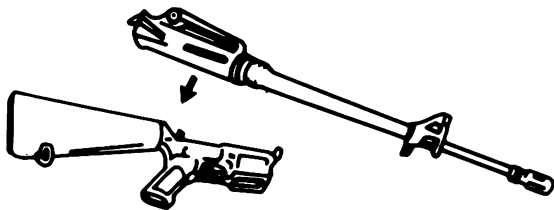
BE SURE BOLT IS STILL UNLOCKED



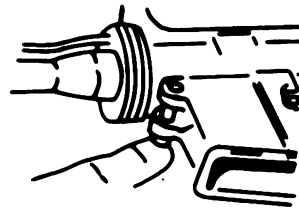
j Slide in bolt carrier group



k Push in charging handle and bolt carrier group together

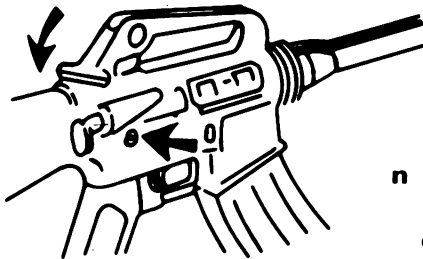
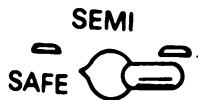


l Join upper and lower receivers



m Engage receiver pivot pin

CAUTION:
Selector lever must be on safe or semi before closing upper receiver

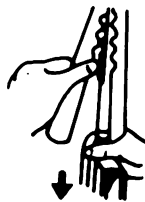


n Close upper and lower receiver groups. Push in takedown pin



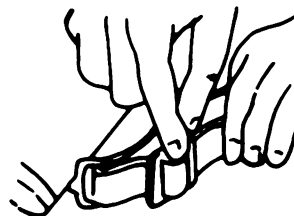
HOLD SLIP RING DOWN

o PUT HANDGUARDS IN PLACE



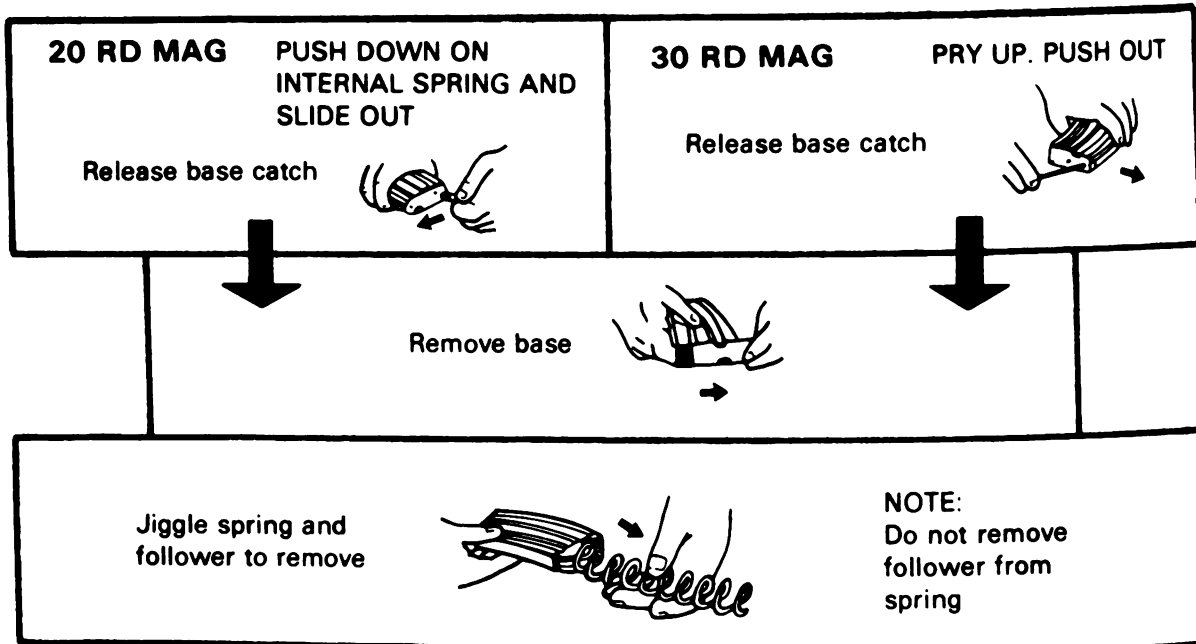
RELEASE SLIP RING

CHECK FOR FULL ENGAGEMENT

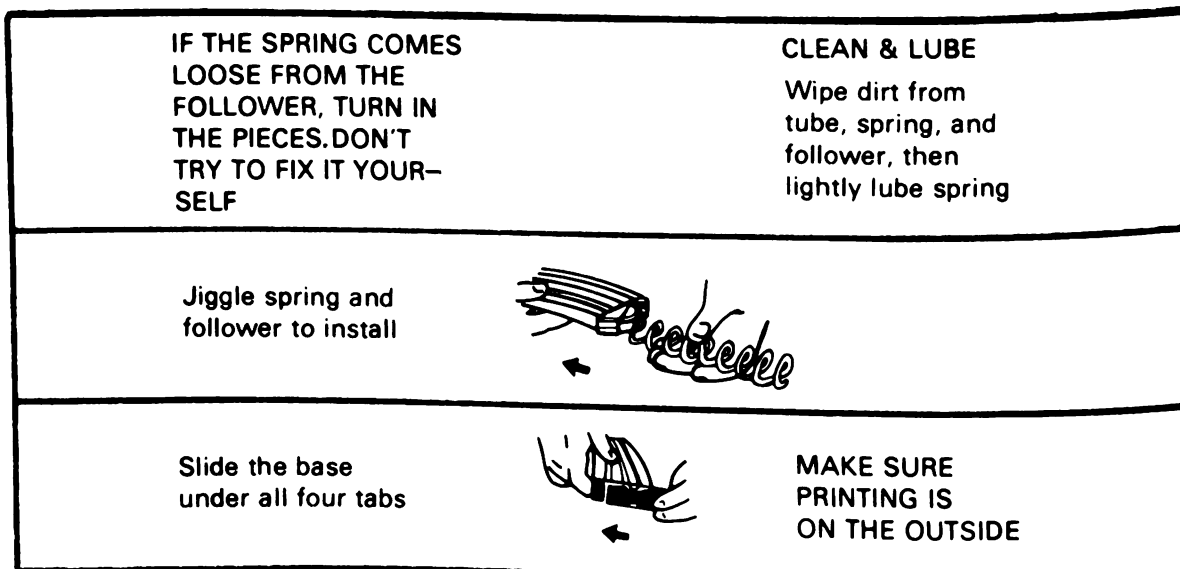


p Replace sling

5. MAGAZINE DISASSEMBLY

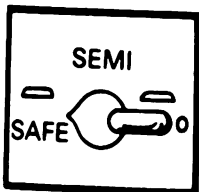


6. MAGAZINE ASSEMBLY



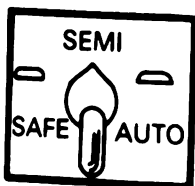
7. FUNCTIONAL CHECK

(REMOVE MAG . . . CHECK CHAMBER)



SELECTOR LEVER ON: *safe*

Pull charging handle to rear and release. Place on safe. Pull trigger. Hammer should not fall.



semi

Place selector in semi. Pull trigger and hold to rear. Hammer should fall. Pull charging

handle to rear and release. Release trigger and pull again. Hammer should fall.



auto

Place selector in auto. Pull charging handle to rear and release. Pull trigger and hold to rear, hammer should fall. Pull

charging handle to rear and release. Release trigger and pull again. Hammer should not fall.

8. CLEANING AMMUNITION

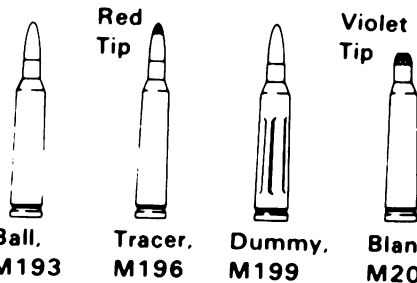
Cleaning Ammunition. Use a clean, dry cloth to wipe dirt and foreign matter from ammunition. Do not coat with oil.

WARNING

DO NOT FIRE. . .

- Seriously corroded ammunition
- Dented cartridges
- Cartridges with loose bullets
- Cartridges exposed to extreme heat (135°) until they have cooled

Use only authorized ammo that is manufactured to US specs.



KEEP DRY, CLEAN, AND FREE OF CRUD.
YOUR LIFE DEPENDS ON IT!

NOTE: The following items should be cleaned to insure that your weapon works properly. They are also subject to inspection by an NCO.

Bolt	Gas Tube and Ports
Sights	Stock Drain Hole
Receiver	Bore and Flash Suppressor
Charging Handle	Magazine Catch and Magazine Well
Handguards	

He'll check the overall condition of the SIGHTS, BIPOD, STOCK, AND HANDGUARDS.

So, be prepared, keep it clean and lubed.

REFERENCES

TM 9-1005-249-10, Operator's Manual: M16A1 Rifle, Apr 77 (pages 9 thru 33).

TEC Lesson 939-071-0010-F, Disassembly and Assembly of the M16A1 Rifle.

TEC Lesson 939-071-0011-F, Maintaining the M16A1 Rifle.

C 21-1-3, M16 Maintenance Card.

TASK**071-311-2003**

**Load, Reduce a Stoppage, and Clear
An M16A1 Rifle**

CONDITIONS

Given an assembled and operational M16A1 rifle, a magazine loaded with either live or blank ammunition. Performance of this task with blank ammunition can be accomplished either in garrison or in the field. Live firing requirements are only applicable to actual combat situations or range firing.

STANDARDS

In accordance with the performance measures:





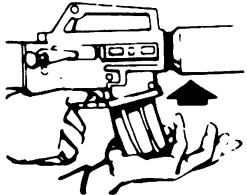
1. Load and chamber a round within 5 seconds.
2. Eliminate stoppages, either real or simulated, within 10 seconds, by using immediate action.
3. Clear the M16A1 rifle within 10 seconds.

PERFORMANCE MEASURES

1. LOADING A ROUND.

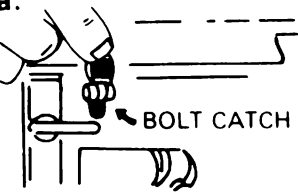



Loading a round.

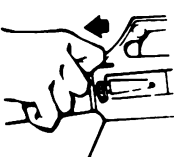
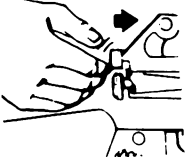

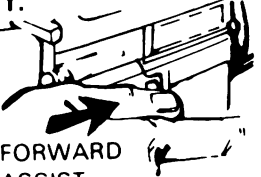
<p>a.</p> 	<p>b.</p>  <p>With hammer cocked, place selector lever on SAFE.</p>	<p>c.</p>  <p>Open bolt and eyeball chamber. Clear?</p>
<p>d.</p>  <p>Push upward until magazine catch engages and holds magazine.</p>	<p>e.</p>  <p>Tap upward to make sure it's seated right.</p>	<p>f.</p> <p>MAGAZINE MAY BE LOADED WITH BOLT ASSEMBLY OPEN OR CLOSED</p>

2. CHAMBERING A ROUND

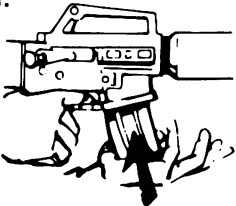
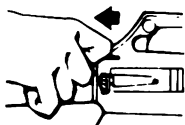
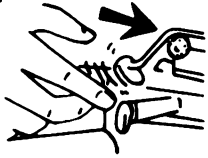
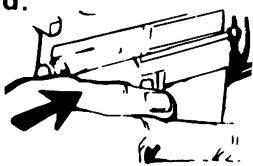
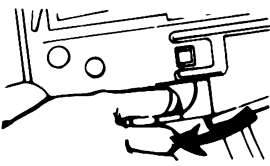
BOLT ASSEMBLY OPEN

<p>a.</p>  <p>BOLT CATCH</p> <p>Depress upper portion of bolt catch.</p>	<p>b.</p>  <p>FORWARD ASSIST</p> <p>Tap forward assist to insure bolt is fully forward & locked.</p>
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BOLT ASSEMBLY CLOSED

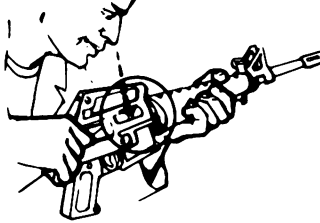
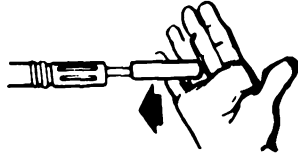
<p>c.</p>  <p>Pull charging handle fully rearward.</p>	<p>d.</p>  <p>Release the charging handle.</p>	<p>e.</p>  <p>Never "ride" the charging handle. Let it go on its own.</p>	<p>f.</p>  <p>FORWARD ASSIST</p> <p>Tap forward assist to insure bolt is fully forward & locked.</p>
---	---	---	---

3. IMMEDIATE ACTION. If your rifle stops firing before you do, remember: S-P-O-R-T-S. That key word will help you remember the following actions: Slap, Pull, Observe, Release, Tap, Shoot.

<p>a.</p>  <p>SLAP upward on magazine to make sure it's properly seated.</p>	<p>b.</p>  <p>PULL charging handle all the way back. OBSERVE ejection of case or cartridge. Eyeball chamber and check for obstruction.</p>	<p>c.</p>  <p>If cartridge or case is ejected or chamber is clear, RELEASE charging handle to feed new round. (Don't ride the charging handle.)</p>
<p>d.</p>  <p>TAP forward assist.</p>	<p>e.</p>  <p>Now SHOOT. If it won't fire, look for trouble and apply remedial action.</p>	

4. REMEDIAL ACTION.


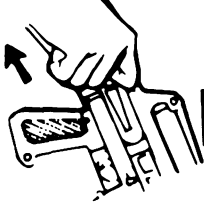

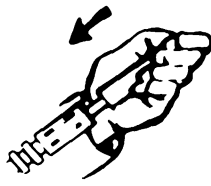
WARNING: If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.

<p>a.</p> <p>If your rifle fails to fire after performing steps a thru e for immediate action check again for jammed cartridge case.</p> 	<p>b.</p>  <p>If a cartridge case is in the chamber, tap it out with a cleaning rod.</p>
--	---

c. IF YOUR RIFLE STILL FAILS TO FIRE, CHECK TROUBLESHOOTING IN TM 9-1005-249-10, pages 48 through 54.

WARNING: If you hear a "POP" or feel less RECOIL during firing, immediately CEASE FIRE, remove the magazine (1), lock the bolt to the rear (2), and place the selector level on the "SAFE" position (3). Inspect the bore, or insert a cleaning rod into the bore to insure there is not a round lodged in it (4).

DO NOT APPLY IMMEDIATE ACTION.

 <p>1</p>	 <p>2</p>	 <p>3</p>	 <p>4</p>
<p>If a projectile is lodged in the barrel of the weapon. DO NOT attempt to remove it. Turn the weapon in to the armorer.</p>			

5. CLEARING THE RIFLE.

a.

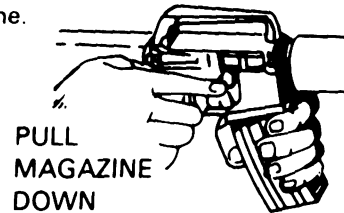
Place selector on SAFE. If weapon is not cocked, lever cannot be pointed toward SAFE.



b.

PRESS
CATCH BUTTON

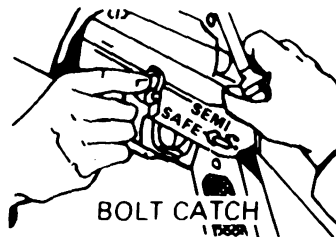
Remove magazine.



c.

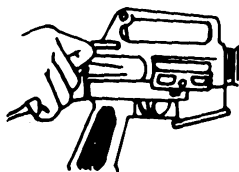
To lock bolt open, pull charging handle rearward, press bottom of bolt catch, and allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place on SAFE.

PULL
CHARGING HANDLE



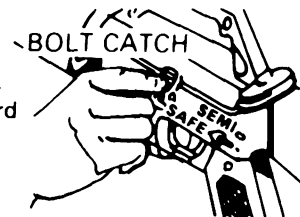
d.

Eyeball receiver and chamber to insure these areas contain no ammo



e.

With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.



REFERENCES

TM 9-1005-249-10, Operator's Manual: M16A1 Rifle.

TEC Lesson 939-071-0009-F, Loading and Unloading the M16A1 Rifle.

TEC Lesson 939-071-0012-F, Preventing and Correcting Common Malfunctions.

TASK**071-311-2004**

Battlesight Zero an M16A1 Rifle

CONDITIONS

On a 25-meter firing range, given an M16A1 rifle equipped with either the standard M16A1 sights or the low light level sight system (LLLSS), 18 rounds of 5.56-mm ammunition, battlesight zero target, sandbag for support, and a rifle shot group analysis card: semiautomatic fire with M16A1 and M14 rifles (C 21-1-4, Mar 74).

STANDARDS

Place the center of a three-round shot group at the X - 2.4 centimeters below the Canadian bull's-eye, and have the shot group touch or fall within a 5.2-centimeter-diameter circle centered on the X.

PERFORMANCE MEASURES

1. Sights. The M16A1 rifle has two adjustable sights. Elevation adjustments are made on the front sight and windage adjustments are made on the rear sight. The rifle comes equipped with either the standard sight system or LLLSS.
 - a. The Standard Sight System.
 - (1) The rear sight has two parts:
 - (a) An aperture marked "L" for ranges beyond 30 meters and an unmarked aperture for ranges from to 300 meters.
 - (b) A windage drum for windage adjustments.
 - (2) The front sight consists of a rotating sight post with spring-loaded detent.

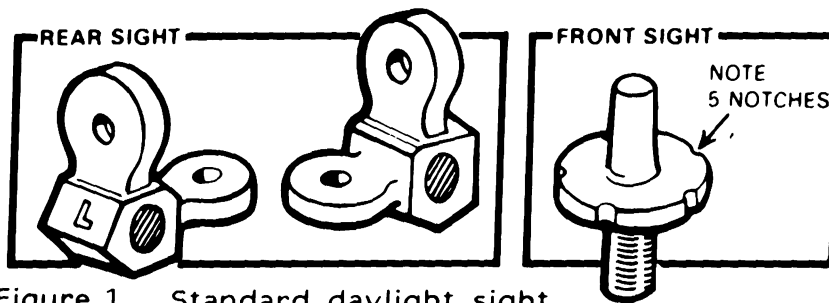


Figure 1. Standard daylight sight.

b. The Low Light Level Sight System.

NOTE: Not every rifle will have this sight.

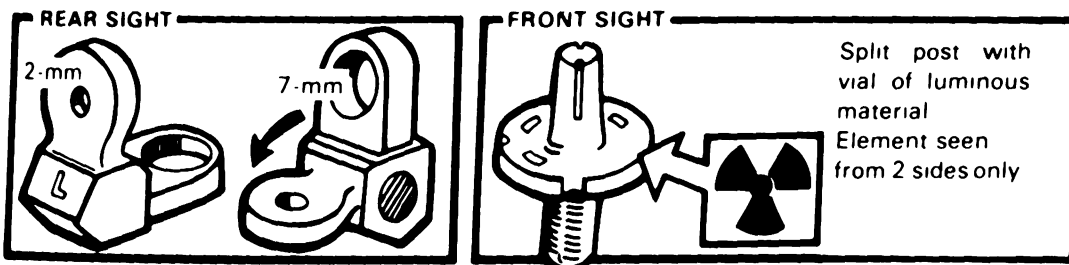


Figure 2. Low light level sight system.

(1) The rear sight in this system also has two parts:

(a) A 2-mm aperture marked "L" which is used for zero and ranges to 460 meters under normal conditions. The other aperture (7-mm) is larger than the standard sight and is used for night and limited visibility firing.

(b) A windage drum for windage adjustments (same as standard system).

(2) The front sight has only four notches (clicks) of elevation (the standard system has five). This permits the firer to adjust the sight so he can see the luminous part through the rear sight.

CAUTION: The front sight post contains a small glass vial of radioactive promethium 147. Take care not to bump, abuse, tamper with, or alter the post in any manner. DO NOT blacken or soot-up the front sight.

2. Sight Adjustment (low light and standard).



Figure 3. Sight adjustment.

- a. Rear Sight. To adjust windage, depress detent and rotate drum to desired direction. To move point of impact to right, turn drum clockwise in direction of arrow and letter R. To move left, move drum counterclockwise. Each graduation (notch) moves the point of impact of bullet as indicated in chart.
- b. Front Sight. To adjust elevation, depress detent, rotate post. To raise strike of bullet, rotate post in the direction of arrow marked up. Reverse the direction of rotation to lower strike of bullet. Each graduation (notch) moves the point of impact of bullet as indicated in chart.

IMPACT		DISTANCE
STANDARD	LOW LIGHT LEVEL	
0.7cm (17/64in)	0.9cm (23/64in)	25 meters
2.8cm (1-3/32in)	3.5cm (1-3/4in)	100 meters
5.6cm (2-13/64in)	7.0cm (2-3/4in)	200 meters

3. Battlesight Zeroing.

- a. Sight Picture. In aiming, the firer is concerned with correctly pointing his rifle so the bullet will hit the target when he fires. To do this, he must have the rear sight, the front sight post, and the target or aiming point in their proper relationship--known as sight picture. A correct sight picture is obtained when the sights are perfectly aligned and the aiming point (target) is in the correct relationship to the front sight post (fig 4b). Sight picture includes two basic elements: sight alignment and placement of the aiming point.

- b. Sight Alignment. To obtain correct sight alignment, the sights are aligned as shown in figure 4a. Notice that the top center of the front sight post is exactly in the center of the rear sight aperture. If an imaginary horizontal line were drawn through the center of the rear sight aperture, the top of the front sight post would touch this line. If an imaginary vertical line were drawn through the center of the rear sight aperture, the line would bisect the front sight post. The firer insures that he has perfect sight alignment by concentrating his attention and focusing his eye on the front sight post through the indistinct or fuzzy appearing rear sight aperture. By doing this, any errors in sight alignment can be easily detected and corrected.
- c. Placement of the Aiming Point. The aiming point (target on which the firer has aligned his rifle sights) is correctly placed when it is centered on and appears to touch the top of the front sight post (fig 4c). If the aiming point is correctly positioned, an imaginary vertical line drawn through the center of the front sight post will appear to split the front sight post in half.
- d. Battlesight Zero Target. The standard 25-meter target (fig 5) is used when determining the battlesight zero for the M16A1 rifle. Vertical and horizontal lines are printed on the target, forming 1.4-centimeter squares. One click of elevation or windage will move the strike of the bullet 0.7 centimeters at a range of 25 meters. Thus, on the 25-meter target, two clicks of elevation or windage will move the strike of the bullet one square.

NOTE: The LLLSS has only four clicks of elevation, but it is adjusted the same as the standard sight. The difference in sight movement per click is not critical during firing.



Figure 4. Correct sight picture.

Figure 5. 25 meter target.

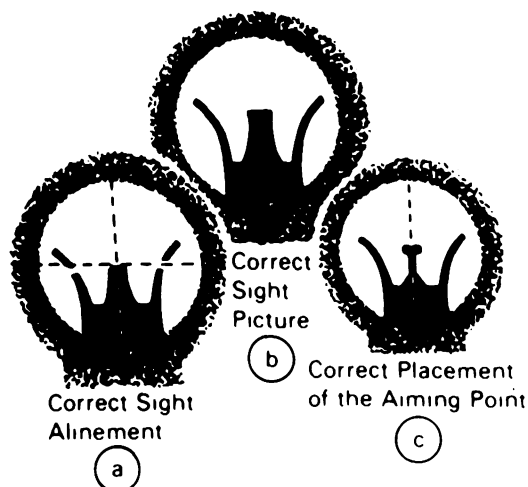
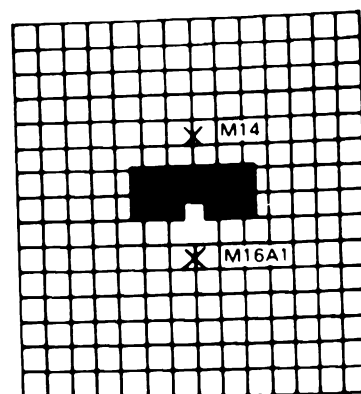


Figure 4. Correct sight picture.



NOTE TWO CLICKS OF ELEVATION OR WINDAGE WILL MOVE THE STRIKE OF THE BULLET ONE SQUARE ON THIS TARGET

Figure 5. 25 meter target.

- e. Determining the Battlesight Zero. The 250-meter battlesight zero is determined by firing a series of three-round shot groups at the 25-meter target. The firer aims at the distinctive aiming point at the bottom center of the black rectangle (base of the white cutaway portion) and adjusts his sights until the center of this acceptable shot group is located 5.2 centimeters directly below the aiming point (fig 6) on or around the X.

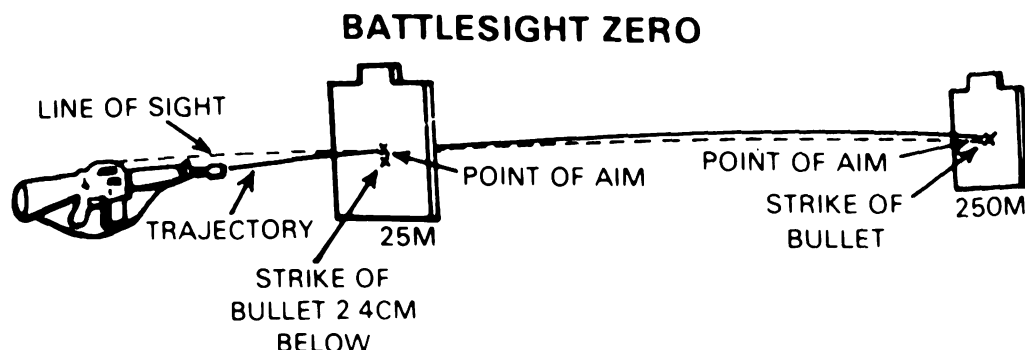
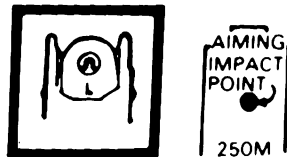


Figure 6. Determining the battlesight zero.

NOTE: To battlesight zero, adjust your sights so you can hit an aiming point at 250 meters. Zeroing can also be done on a 25-meter range by adjusting the sights so that the bullet will strike 2.4 centimeters below the point of aim. If your M16A1 has an LLLSS and you can't see the vial after zeroing, turn front sight post one click down for use during periods of limited visibility.

4. Using Low Light Level (Promethium) Sight System.

- a. During daylight firing, use aperture marked L. Effective range is 250 meters (original battlesight zero).



- b. At night and in limited visibility, use unmarked (7-mm) aperture. Obtain good sight picture using daylight procedure. After target detection, obtain good sight alignment by centering top of luminous portion of front sight post within 7-mm aperture on target and fire. Under certain light conditions, front sight post can be seen, but you can't determine whether you are looking through, above, or to the side of rear sight aperture. Practice positioning stock against shoulder and looking through rear aperture.



REFERENCES

- FM 23-9, M16A1 Rifle and Rifle Marksmanship.
- TM 9-1005-249-10, Operator's Manual: M16A1 Rifle.
- C 21-1-4, Rifle Shot Group Analysis Card: Semiautomatic, Automatic Fire--M14, M16A1 Rifles.

TASK**071-311-2006**

**Use Limited Visibility Firing Techniques with
the M16A1 Rifle**

CONDITIONS

As a member of a rifle squad in a defensive position during daylight, given an M16A1 rifle, a magazine and ammunition, with sticks or rocks and a board or log available in the area, and instructions on the individual's preplanned sector of fire for use during periods of limited visibility.

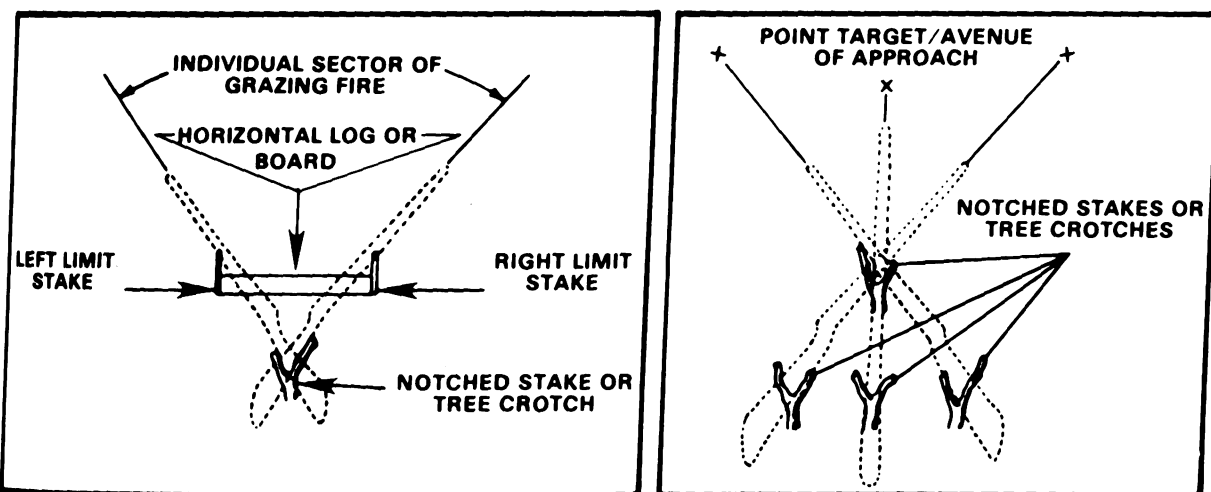
STANDARDS

Emplace and align aiming and firing stakes on identifiable probable enemy avenues of approach, assault positions, and automatic weapons positions, to include left and right limiting stakes (one may be parapet) indicating individual's preplanned sector of fire limits, so that when the weapon is employed using the stakes, rounds:

1. Can be placed in selected target areas/positions.
2. Are all within sector of fire (FPF or fires on sector limits must be grazing fire).

PERFORMANCE MEASURES

1. Physically locate and identify probable enemy positions and avenues of approach.
2. Prepare field expedient aiming, firing, and limiting stakes (notched stick or tree crotch; rocks, board, or log) which are able to support the weight of your weapon).



3. Insure stakes, horizontal log, or board are well seated into the ground.
4. Place the weapon in the rests (notched stake, tree crotch, log, or board) and aim the M16A1 to hit the desired targets or cover a sector with grazing fire, and adjust the rests to hold the weapon in place.
5. To fire, hold the M16A1 in the rest with your right shoulder firmly against the weapon's butt plate.

NOTE: The weapon must be held in the exact position in which it was held when it was sighted in.

6. By using additional stakes or horizontal board or log, you can lay the weapon for grazing fire along more than one line or to cover an entire sector depending on the terrain. Grazing fire is achieved when the cone of fire does not rise 1 meter above the ground.

REFERENCES

None.

TASK

071-311-2007

Qualify With the M16A1 Rifle

CONDITIONS

Situation 1: Daylight Firing. On a standard record firing range given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the promethium sights, 4 magazines of 10 rounds each, a record fire scorecard, and the requirement to fire record fire for qualification.

Situation 2: Night Firing. On a standard night fire record range given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the LLLSS sights, 3 magazines of 3 rounds each for practice firing and 80 rounds for record fire, and the requirement to fire night record fire for qualification.

STANDARDS

Situation 1: Attain a MINIMUM SCORE of 17 hits out of a possible exposures.

Situation 2: Attain a MINIMUM SCORE of 20 hits out of a possible exposures.

SQT ADMINISTRATION REQUIREMENTS

SQT credit will be awarded as follows:

Arms Qualification/Evaluation	SQT Units
Unqualified (NO GO)	0
Marksman (GO)	1
Sharpshooter (GO)	1
Expert (GO)	1
Nonobserved	Neither count for nor against total SQT score.

The night-firing portion of arms qualification will not be included in the performance certification component of the SQT.

QUALIFICATION SCORES AND RATINGS:

	STANDARD RECORD	KNOWN DISTANCE	COURSE "C"
Possible	40	500	42
Expert	28-40	420-500	31 and above
Sharpshooter	24-27	360-419	24-30 inclusive
Marksman	17-23	300-359	11-23 inclusive
Unqualified	16 and below	299 and below	10 and below

NOTE: FM 23-9 superseded FM 23-71; however, pre-mobilization readiness proficiency "C" courses prescribed for use by reserve components were inadvertently omitted from 23-9 as was change 1 to FM 23-71 (Feb 68) which added appendix I for those units which have only known-distance facilities. These courses of fire may be used unless superseded by subsequent instructions. The following conditions and standards are to be used by units that DO NOT have a standard record fire range.

CONDITIONS

Situation 3: During daylight on a known-distance range (as described in para 5 of appendix I, FM 23-71, change 1), given a zeroed M16A1 rifle, 50 rounds of caliber 5.56-mm ammunition (5 magazines of 10 rounds each to engage each target with 10 rounds), a requirement to fire, Record Firing, Known Distance (total rounds 100) as outlined in para 16d, appendix I of FM 23-71.

Situation 4: During daylight on a 1,000-inch range, given a zeroed M16A1 rifle, 42 rounds of caliber 5.56-mm ammunition, a requirement to fire standard course "C" for record fire as outlined in appendix D of FM 23-71.

STANDARDS

Situation 3: Fire Known-Distance Record Firing Table as outlined para 16, appendix I of FM 23-71 (change 1) and achieve a minimum score of 300.

Situation 4: Fire Record Fire Course "C" as outlined in appendix D FM 23-71 and achieve a minimum score of 11.

WARNING

DANGEROUS PROCEDURES

- Be sure the cam pin is installed in the bolt group. If it isn't, your rifle can still fire, but it could possibly explode, causing you harm.
- DO NOT exchange or switch bolt assemblies from one M16A1 to another. It could cause damage to both you and the rifle.
- If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.
- Use only authorized ammo that is manufactured to US specs.
- If your bolt fails to unlock and you try to free it by banging the butt stock on the ground, keep yourself clear of the muzzle.
- If there's water in the barrel, don't fire the rifle. It could explode.
- If a noticeable difference in sound or recoil is experienced, STOP FIRING. Either condition could indicate an incomplete propellant burn and a bullet still in the bore. Retract bolt slowly and remove fired cartridge case. Clear weapon and check for unburned powder grains in the receiver or bore and for a bullet in the bore. Remove unburned propellant or bullet from bore before resuming firing, or barrel could explode. If bullet is lodged in bore, turn in rifle to direct support maintenance.

REFERENCES

FM 23-9, w/C1, M16A1 Rifle and Rifle Marksmanship, Jun 74.

TM 9-1005-249-10, Operator's Manual, M16A1 Rifle, Apr 77.

TASK

071-325-4402

Engage Enemy Targets with Hand Grenades

CONDITIONS

During daylight; wearing LBE, with individual weapon, given five M69 practice hand grenades, five M288 practice fuzes, and a requirement to engage the following targets at the designated ranges.

Target 1--dismounted enemy troops clustered at a range of approximately 35 meters. The situation and available cover will not permit moving closer to the target.

Target 2--an enemy emplacement without overhead cover (foxhole, trench, or mortar emplacement) at a range of 20 meters. The situation and available cover will not permit moving closer to the target.

Target 3--an enemy position with overhead cover (bunker, building, cave, etc.) which can be approached along a covered route.

STANDARDS

For each target, throw at least one grenade so that it explodes within the effective bursting radius for that target as listed below without exposing yourself for more than 3 seconds at any one time.

TARGET	EFFECTIVE ENGAGEMENT
No 1--Troops in the open	Within 5 meters of center
No 2--Troops dug in without overhead cover	Inside position
No 3--Troops with overhead cover	Inside enclosure

PERFORMANCE MEASURES

1. Throwing Hand Grenades.

- a. The Grip. The safest and easiest way to grip a hand grenade is to hold it so that the safety lever is held down by the thumb while keeping the pull ring (and safety clip if present) free and facing the nonthrowing hand.

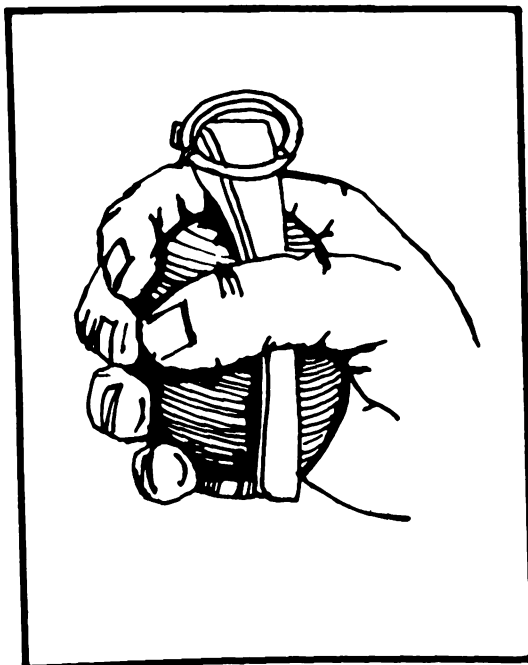


Figure 1. Proper grip of the grenade (right-hand thrower).

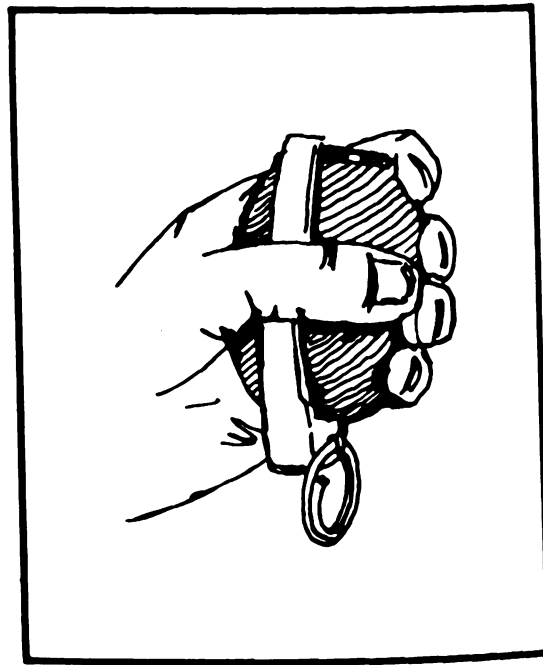


Figure 2. Proper grip of the grenade (left-hand thrower).

- b. Body Positioning and Arming. No matter what position is used (standing, kneeling, prone) when throwing a hand grenade you should be as comfortable and natural as possible. The two most important points in accurate throwing are body-target alignment and eye-target focus. Line your body up with the target as though you were going to throw a football or basketball. Keep watching the target as you throw and let your arm swing naturally to it. Follow through with your throwing motion and take cover. If possible, you or a buddy should watch where the grenade lands. Make sure you properly arm the grenade before you throw it. Remove the safety clip, pull the pin, throw the grenade.

c. To Throw a Hand Grenade (fig 3).

- (1) Look at the target and judge the distance to it.
- (2) Line your body up so you can throw comfortably.
- (3) Hold the grenade under your chin and, with the index finger of your other hand, pull and twist the pull ring (at the same time, pull the safety clip off the lever with your thumb).
- (4) As the pin is removed, look back at your target.
- (5) Keeping your eye on the target, throw the grenade overhanded.
- (6) Release the grenade after it comes into your field of vision and follow through.

NOTE: Turn head to look at target.

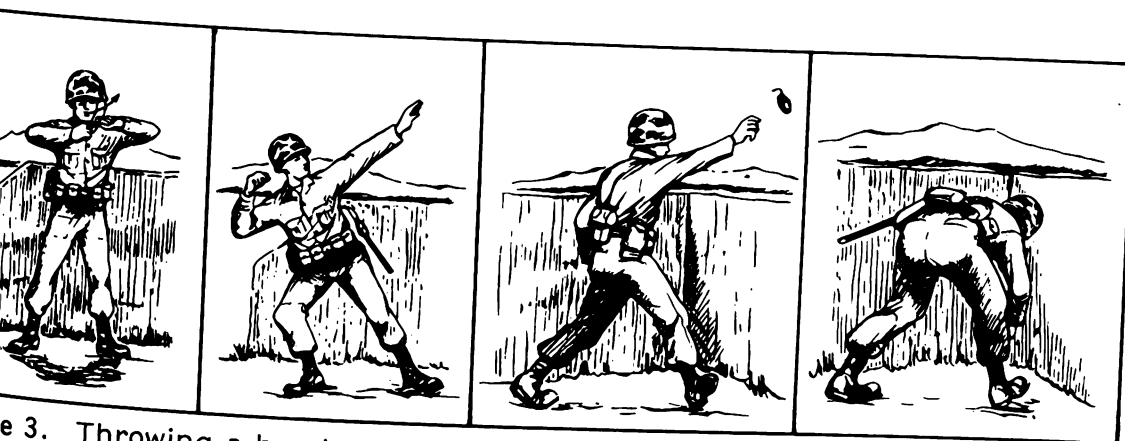


Fig 3. Throwing a hand grenade.

NOTE: One exception to this procedure is the riot control grenade ABC-M25A2. Since there is no lever, you must hold the arming sleeve down instead. Use the thumb of your throwing hand to do this.

- d. Using Fragmentation Grenade M67 with Time Delay Fuze M213 (fig 4). This grenade is your best all-round choice. It can be thrown a little over 40 meters by most soldiers and will kill or injure exposed soldiers who are within 15 meters of it when it explodes. You should, with some practice, be able to throw the grenade to within 5 meters of a selected point 35 meters away from you or within a fighting position 2 meters wide at 20 meters range. Grenades thrown at these targets may hit and roll into the target area, but you should practice to hit the fighting position "on the fly" in order to destroy position with frontal cover. Another technique which can be employed with these grenades is the cookoff. To do this, you must release the safety lever and hold the grenade for a two count (YOU MUST NOT HOLD IT LONGER, HOWEVER). Then when the grenade is thrown, enemy personnel will not have time to pick it up and throw it back. In addition, if it is thrown high into the air, it can explode over the target (airburst).

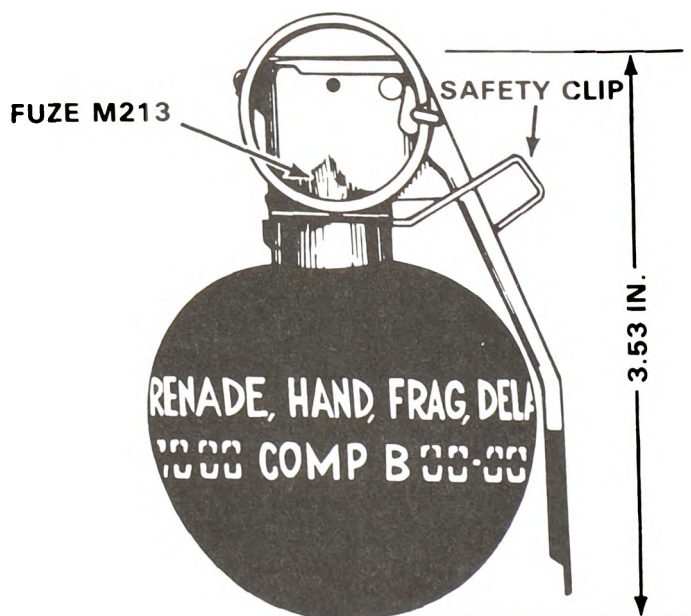


Figure 4. Fragmentation hand grenade M67.

REFERENCES

FM 23-30, Grenades and Pyrotechnic Signals.

TM 9-1330-200-12, Operator's and Organizational Maintenance Manual: Grenades, Hand and Direction: M18.

TEC Lesson 942-071-0001-F, The Hand Grenade - Types and Uses.

TEC Lesson 942-071-0002-F, Hand Grenade Maintenance and Identification.

TEC Lesson 942-071-0003-F, The Hand Grenade: Carrying, Arming, and Throwing.

TASK

071-327-0201

Maintain an Appropriate Level of Physical Fitness (Male Only)

CONDITIONS

You will be tested to measure your physical fitness. If you are assigned to a combat or combat support unit, you will be given the Advanced Physical Fitness Test. If you are assigned to a combat service support unit or a TDA organization, you will be given the Staff and Specialist Physical Fitness Test. This test will be in daylight at a site established for the physical fitness test appropriate to your unit.

STANDARDS

You must demonstrate, once every 6 months, that you can meet or exceed the minimum level of physical fitness required of each member of your unit in accordance with the standards contained in AR 600-10 by:

1. Exceeding the minimum standard score of 60 points on each test event with a total score of 300 or more points on the Advanced Physical Fitness Test if you are under the age of 40 and are assigned to a combat or combat support unit.
2. Exceeding the minimum standard total score of 300 or more points on the Staff and Specialist Physical Fitness Test if you are under the age of 40 and are assigned to a combat service support or TDA unit.

PERFORMANCE MEASURES

1. Complete the five events of the Advanced Physical Fitness Test (APFT) listed below, as outlined in FM 21-20.
 - a. Inverted crawl

- b. Run, dodge, and jump
 - c. Horizontal ladder
 - d. Bent-leg situps
 - e. Two-mile run
2. Personnel over the age of 40 may elect not to take the APFT. If they elect to take it, they must complete the test once they have begun the first event or else they will receive a NO GO for the entire test.
3. Complete the five events of the Staff and Specialist Physical Fitness Test listed below, as outlined in FM 21-20.
- a. Pushups
 - b. Run, dodge, and jump
 - c. Horizontal ladder
 - d. Bent-leg situps
 - e. One-mile run

SQT REQUIREMENTS

- 1. Failure to meet the standards for either test will result in an evaluation of NO GO. Personnel with profiles, who cannot complete all five events of either test, will be scored as non-observed on the performance certification portion of the SQT.
- 2. SQT credit will be awarded as follows:

EVALUATION

SQT POINTS

NO GO

0

GO

1

NON-OBSERVED

Neither counts for nor
against total SQT score

REFERENCES

AR 600-9, Army Physical Fitness and Weight Control Program.

FM 21-20, Physical Readiness Training.

TASK**071-327-0210**

Maintain an Appropriate Level of Physical Fitness (Female Only)

CONDITIONS

You will be tested to measure your physical fitness. If you are assigned to a combat or combat support unit, you will be given the Advanced Physical Fitness Test. If you are assigned to a combat service support unit or a TDA organization, you will be given the Staff and Specialist Physical Fitness Test. This test will be conducted during daylight at a test site established for the Physical Fitness Test appropriate to your unit.

STANDARDS

You must demonstrate, once every 6 months, that you can meet or exceed the minimum level of physical fitness required of each member of your unit in accordance with the standards contained in AR 600-9 by:

1. Exceeding the minimum standard score of 60 points each test event with a total score of 300 or more points on the Advanced Physical Fitness Test if you are under the age of 40 and are assigned to a combat support unit.
2. Exceeding the minimum standard total score of 300 or more points on the Staff and Specialist Physical Fitness Test if you are under the age of 40 and are assigned to a combat service support or TDA unit.

PERFORMANCE MEASURES

- Complete the five events of the Advanced Physical Fitness Test listed below as outlined in FM 35-20.
 - a. Shuttle run
 - b. Modified pushups

SKILL LEVEL 1

- c. Run, dodge, and jump
 - d. Modified situps
 - e. One-mile run
2. Personnel over the age of 40 may elect not to take the APFT. Personnel over the age of 40 that elect to take the APFT must complete the test once they have begun the first event or receive a NO GO for the entire test.
3. Complete the five events of the Staff and Specialist Physical Fitness Test listed below as outlined in FM 35-20.
- a. Shuttle run
 - b. Modified pushups
 - c. Run, dodge, and jump
 - d. Modified situps
 - e. Stationary run

SQT REQUIREMENTS

1. Failure to meet the standards for either test will result in an evaluation of NO GO. Personnel with profiles, who cannot complete all five events of either test, will be scored as non-observed on the performance certification portion of the SQT.
2. SQT credit will be awarded as follows:

<u>EVALUATION</u>	<u>SQT POINTS</u>
NO GO	0
GO	1
NON-OBSERVED	Neither counts for nor against total SQT score

REFERENCES

- AR 600-9, Army Physical Fitness and Weight Control Program, Nov 76.
- FM 35-20, Physical Fitness Training for Women, Feb 75, w/C1.

TASK

071-329-1001

Identify Terrain Features (Natural and Manmade) on the Map

CONDITIONS

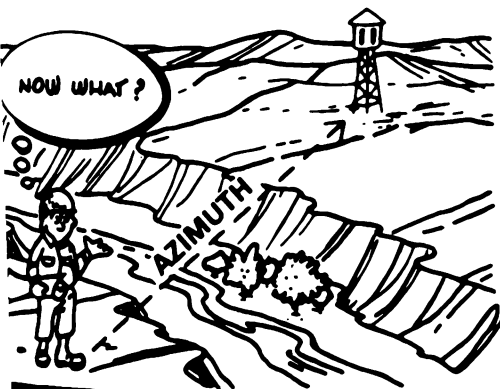
Given a standard 1:50,000 scale military map which includes examples of one or more of each of the natural features identified in 1 through 5 below, and which has examples of the use of colors to identify classes of features as in 6 through 10 below:

- | | |
|---------------|----------|
| 1. Hilltop | 6. Black |
| 2. Ridge | 7. Blue |
| 3. Valley | 8. Green |
| 4. Saddle | 9. Brown |
| 5. Depression | 10. Red |

STANDARDS

Within 3 minutes, identify one of each type terrain feature marked on the map, given to you by your supervisor.

PERFORMANCE MEASURES



Your military map shows something important that ordinary maps don't have. That is elevation (relief)—the slopes, hills, and valleys. You will learn later in this book about locating points, measuring distances, and finding the right direction. But you should also check hills and valleys along the direction you intend to travel before you start. **IT MIGHT SAVE YOU SOME TROUBLE.**

1. To identify terrain features, refer to figure 1.
2. Colors--used to identify a class of features.
 - a. Black--The majority of cultural or manmade features.
 - b. Blue--Water features such as lakes, rivers, and swamps.
 - c. Green--Vegetation such as woods, orchards, and vineyards.
 - d. Brown--All relief features such as contour lines.
 - e. Red--Used to classify manmade features as to their type or use; e.g., main roads, built-up areas, and special features.



Figure 1. Identification of terrain features.



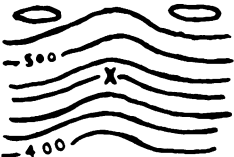


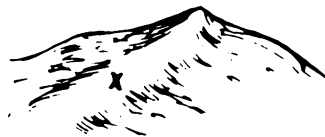
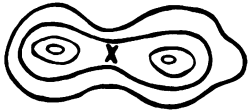



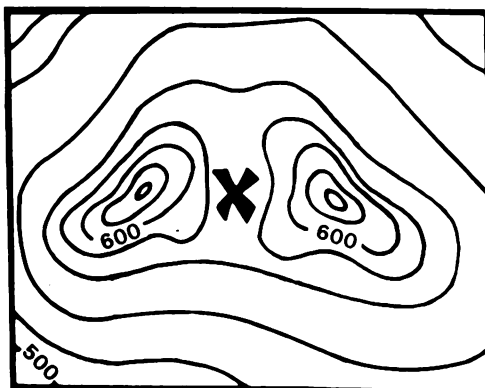
Type of Terrain	On Map	On Ground
HILLTOP	 <p>Last closed contour line.</p>	 <p>When you are located on a hilltop, the ground slopes down in all directions.</p>
VALLEY	 <p>U or V shaped contour lines with the base of the U or V pointing toward higher ground.</p>	 <p>When you are located in a valley, the ground slopes up in three directions and down in one direction.</p>
RIDGE	 <p>U or V shaped contour lines with the base of the U or V pointing away from higher ground.</p>	 <p>When you are located on a ridge, the ground slopes down in three directions and up in one direction.</p>
SADDLE	 <p>Hourglass or figure eight shaped contour lines.</p>	 <p>When you are located in a saddle, there is higher ground in two opposing directions and lower ground in two opposing directions.</p>
DEPRESSION	 <p>Indicated by depression contour lines, with tick marks pointing toward the lower ground.</p>	 <p>When you are located in a depression, there is higher ground in all directions.</p>

Figure 1. Identification of terrain features.

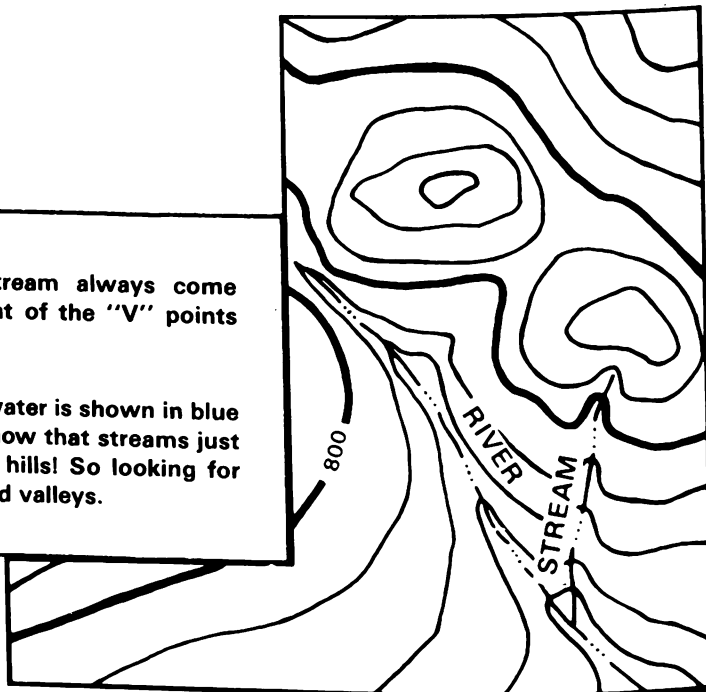
NOTE: Occasionally, other colors may be used to show special information. These will be indicated in the marginal information on the map.



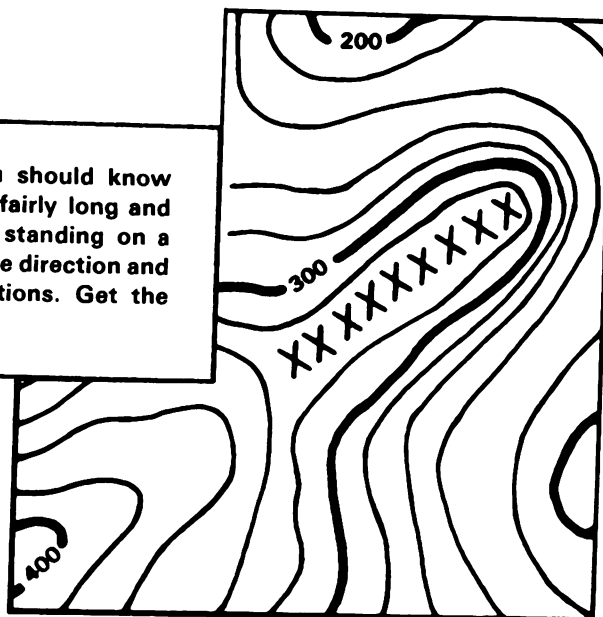
Sometimes contour lines show two hilltops fairly close together. The lower terrain between the two hilltops is called a **SADDLE**. Going through a saddle is sometimes the easiest route to use to get beyond the two hills. Of course, you wouldn't go through a saddle if the enemy was on the hills.

Contour lines across a stream always come together in a "V". The point of the "V" points upstream.

Your legend tells you that water is shown in blue on your map. You already know that streams just don't run along the tops of hills! So looking for streams is a good way to find valleys.



Another terrain feature that you should know about is the RIDGE. A ridge is a fairly long and narrow piece of terrain. If you're standing on a ridge, the ground will go uphill in one direction and downhill in the other three directions. Get the picture? (The U's point downhill.)



REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1.

TEC Lesson 930-071-0013-F, Introduction to Land Navigation.

TEC Lesson 930-071-0016-F, Terrain Features.

TASK

071-329-1002

Determine the Grid Coordinates of a Point on a Military Map Using the Military Grid Reference System

CONDITIONS

Given a standard, 1:50,000 scale military map, a 1:50,000 grid coordinate scale, a pencil and paper, and a point on the map which is labeled for identification (for example, Point A).

STANDARDS

Within 2 minutes, determine the six-digit grid coordinates for a point to within 100 meters (grid coordinates must be preceded by the correct two-letter 100,000-meter-square identifier).

PERFORMANCE MEASURES

To keep from getting lost in the "boonies," you have to know how to find your location or your address. There are no street addresses in a combat area, but the military map can spot your location accurately. It has black lines running up and down (north and south) and crosswise (east and west). They form small squares called grids. These lines are numbered along the outside edge of the map picture. Using these numbers, you can name each square.

NOTE: No two squares have the same number! To get the correct number for a certain grid square, first read from left to right along the bottom and find the line that borders your grid square on the left. Then read up and find the East-West line that borders your grid square along the bottom.

Your address is grid square 1181 (fig 1). How do you know this? Start from the left and read RIGHT until you come to 11, the first half of your address. Then read UP to 81, the last half. Your address is somewhere in grid square 1181.

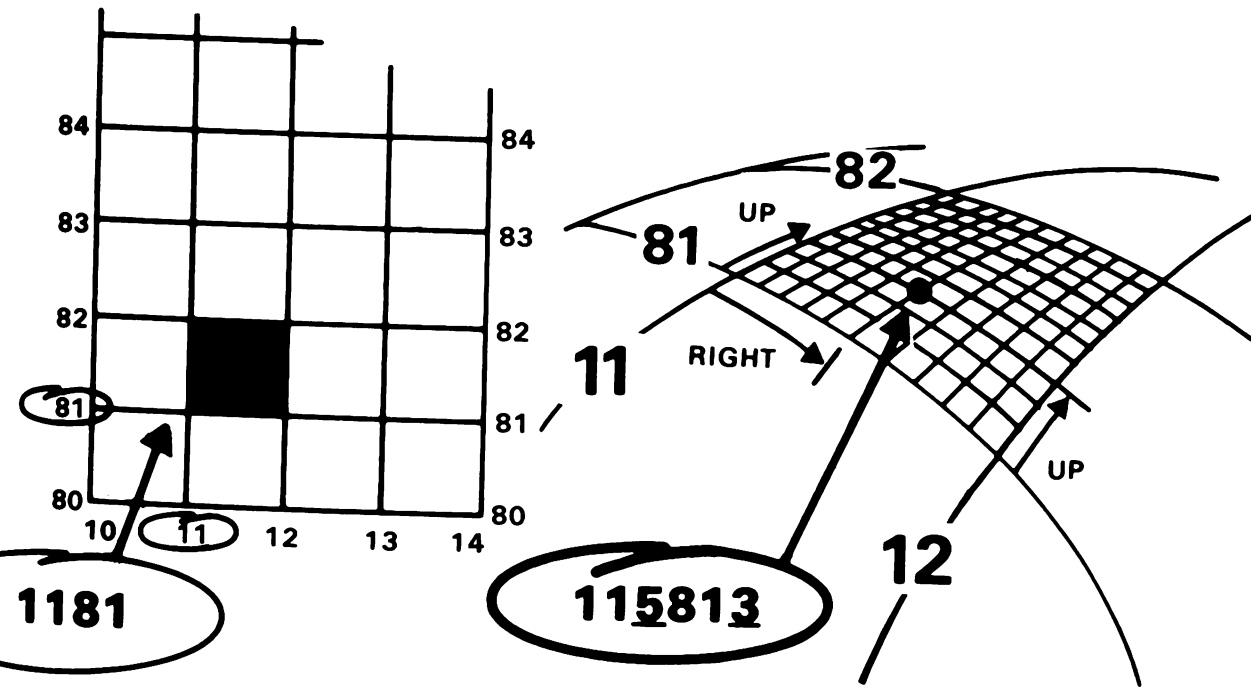


Figure 1. Sample grid square.

Grid square 1181 gives your general neighborhood, but there is a lot of real estate inside that grid square. To make your address more accurate, just add another number to the first half and another to the last half--so your address has six numbers instead of four.

Here's how to get those extra numbers. Pretend that each grid square has 10 lines inside it running north and south and another 10 running east and west. This makes 100 smaller squares. You can estimate where these imaginary lines are.

Suppose you are halfway between line 11 and line 12. Then the extra number is 5 and the first half of your address is 115. Now suppose you are 3/10 of the way between line 81 and line 82. Then the second half of your address is 813. (If you were exactly on line 81, the second part would be 810.) The picture shows that, if you were located where the dot is in grid square 1181, then your address would be 115813.

If you have this little device, you don't have to worry about estimating exactly where you are inside a certain grid square. You do have to use imaginary lines because you can come up with your exact coordinates.

A coordinate scale and protractor is shown in figure 2. It helps you measure small distances inside grid squares. You can also measure angles with it. The coordinate scale and the protractor is nothing more than a square piece of clear thin plastic. It is usually called just "protractor" for short.

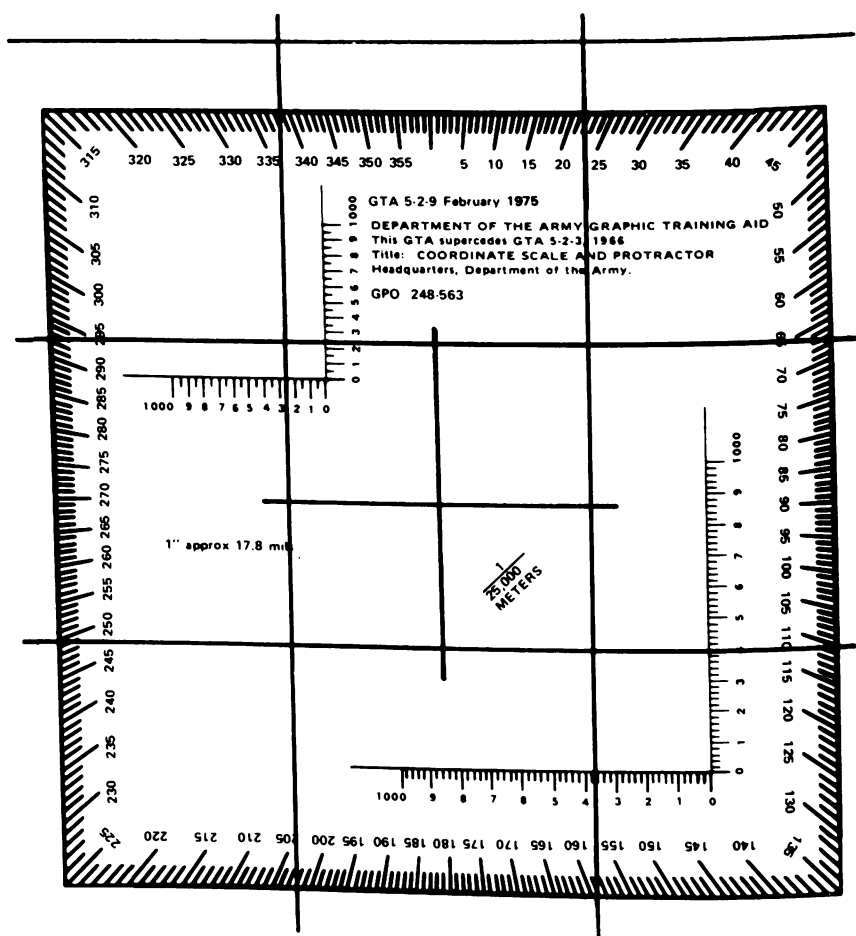


Figure 2. Coordinate scale and protractor.

Here's how to determine the six-digit grid coordinates of a point on a map using a protractor.

1. First, locate the grid square in which the Point is located (the Point should already be plotted on the map) (fig 3).
2. The number of the vertical gridline on the left (west) side of the grid square is the first and second digits of the coordinate.
3. The number of the horizontal gridline on the bottom (south) side of the grid square is the fourth and fifth digits of the coordinate.
4. To determine the third and sixth digits of the coordinate, place the grid coordinate scale on the bottom gridline of the grid square in which Point A is located.

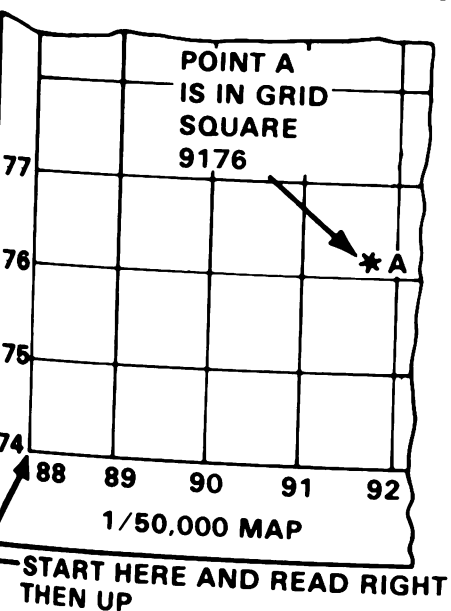


Figure 3. Location on a grid square.

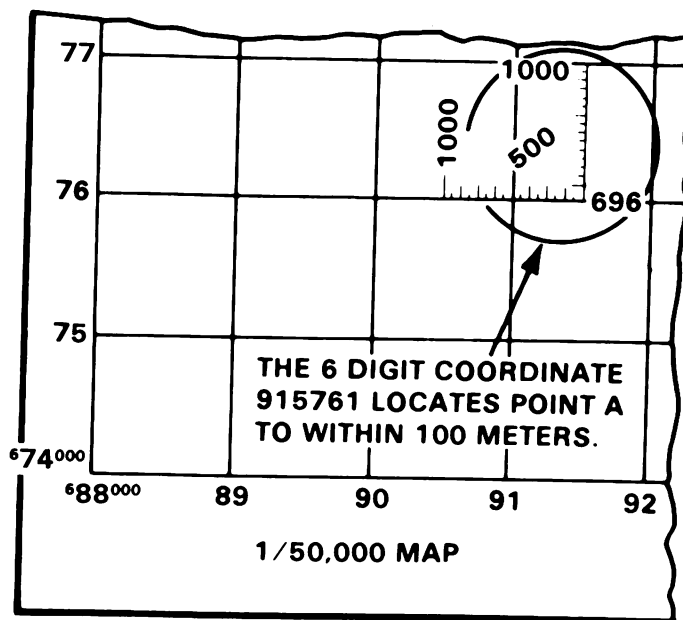


Figure 4. Use of the 6 digit coordinate.

5. Check to see that the zeros of the coordinate scale are in the lower left-hand (southwest) corner of the grid square.
6. Slide the coordinate scale to the right keeping the bottom of the scale on the bottom gridline until Point A is located under the vertical (right-hand) scale (fig 4).

SKILL LEVEL 1

7. The 100-meter mark on the bottom (horizontal) coordinate scale which is nearest the north-south gridline represented by the first and second digit of the coordinate to be determined is the third digit.
8. The 100-meter mark on the right-hand (vertical) coordinate scale which is nearest Point A is the sixth digit.
9. Write the six-digit coordinate on the paper provided.
10. Determine the correct two-letter 100,000-meter-square identifier by looking at the grid reference box in the margin of the map.
11. Place the 100,000-meter-square identifier in front of the six-digit coordinate.

NOTE: As an alternate training method to improve map reading ability, start with a six-digit coordinate and plot the point on the map.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1 (chap 3, pp 3-8 thru 3-20, para 3-4 thru 3-7).

TEC Lesson 930-071-0013-F, Introduction to Land Navigation.

TASK

071-329-1004

Determine the Elevation of a Point on the Ground Using a Map

CONDITIONS

Given a standard 1:50,000 scale military map, pencil, a designated point on the ground, and a requirement to determine the elevation of that point.

STANDARDS

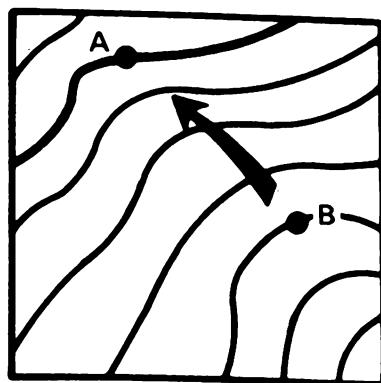
Within 1 minute of locating the point on the map, determine its elevation to within half the value of the contour interval.

PERFORMANCE MEASURES

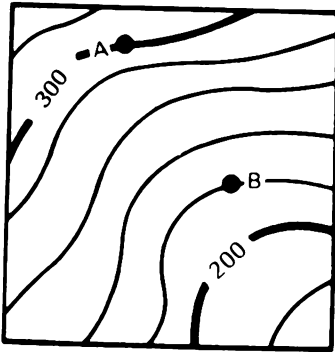
To determine the elevation of a point on a map:

1. Locate the point on the map. (It may already be plotted on the map or given as an eight-digit coordinate.)
2. Determine the contour interval of the map from the marginal information.
3. Locate the index contour line nearest the point for which the elevation is being sought.
4. Count the number of contour lines that must be crossed to go from the numbered lines to the point and note direction--"up" or "down."
 - a. If the point is on contour lines, its elevation is that of the contour.

- b. For points between contours:
 - (1) Points less than one-fourth the distance between lines are considered to be the same as the elevation of the nearest line.
 - (2) Points one-fourth to three-fourths the distance from the lower line are considered to be at an elevation half the contour interval above the lower line.
- c. To estimate elevation of the top of an unmarked hill, add half the contour interval to elevation of highest contour line around the hill.
- d. To estimate the elevation of the bottom of a depression, subtract half the contour interval from the lowest contour around the depression.
- e. On maps that do not show elevation and relief in as much detail as needed, supplementary contour lines may be used. Marginal information indicates the interval, and the supplementary lines are used exactly like solid contour lines.
- f. Bench marks and spot elevations also indicate points of known elevation.

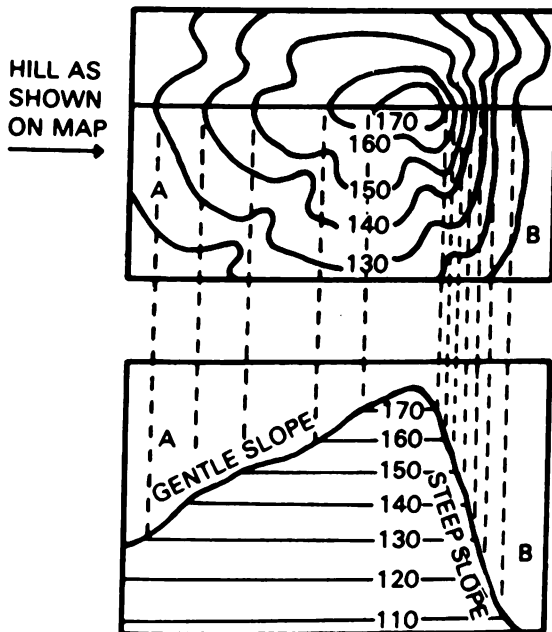


The brown lines on the map are called **CONTOUR** lines. Each line shows the height above sea level. Contour lines never cross one another. Printed at the bottom of the map is the **CONTOUR INTERVAL**, which is the difference in height (elevation) between one brown line and the one next to it. On a map with a scale of 1:50,000 contour interval is usually 20 feet. This would make point "A" 80 feet higher or lower than point "B."

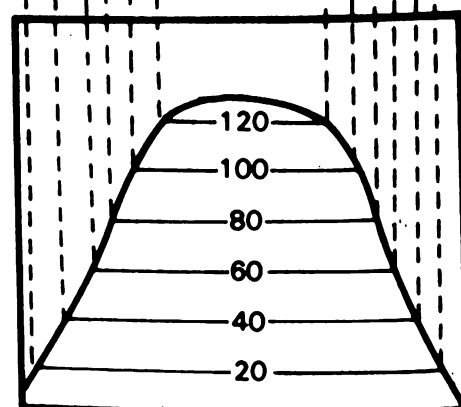
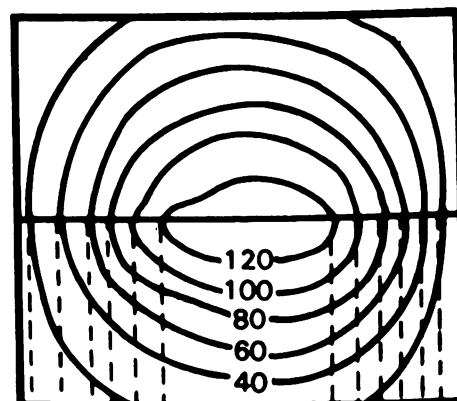
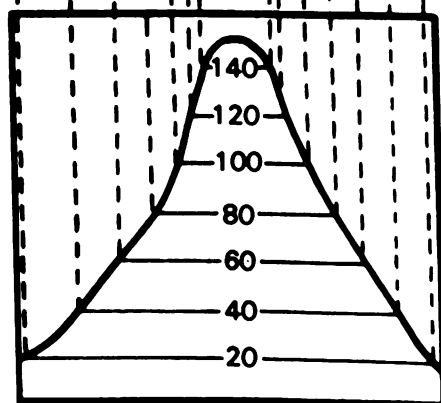
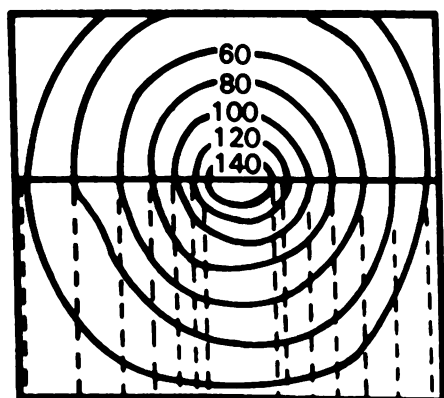


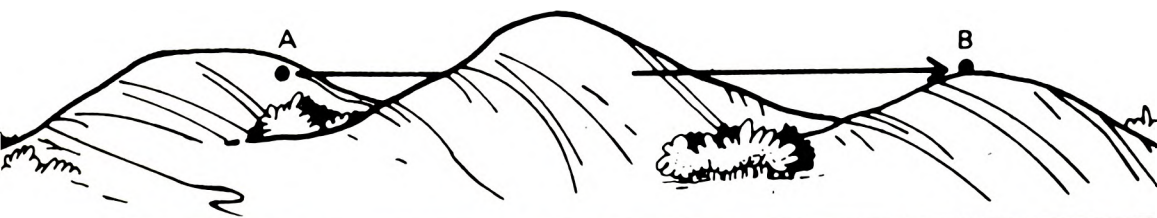
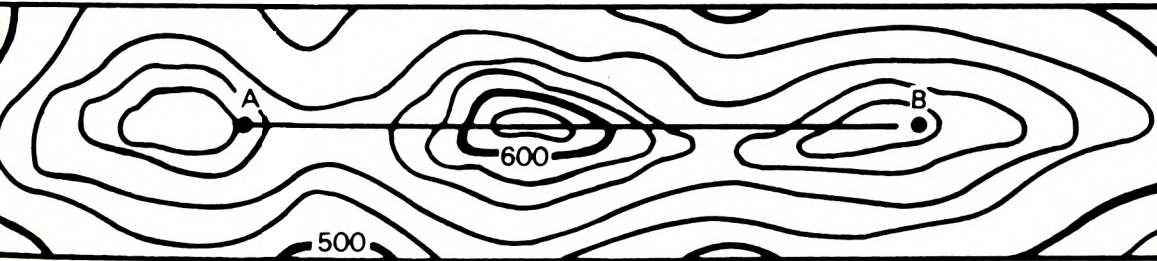
How can you tell from the brown lines whether it's uphill or downhill? Well, every fifth line is heavier than the rest and has a number that gives its elevation. Let's say that the contour interval is 20 feet again. Now you can tell point "A" is 80 feet higher than point "B." Also, if you knew the ground distance between "A" and "B," you could get an idea of how steep the slope was.

Contour lines widely spaced show a gentle slope. When they are close together the slope is steep.



When the contour lines are close together at the top of a hill, the hilltop is pointed. The hilltop is flat when the contour lines are widely spaced at the top.





REMEMBER: A contour line is a brown line on your map that connects points of the same elevation. You can find the contour interval in the margin at the bottom of your map. The heavy brown lines (every fifth one) have the elevation printed on them. You can tell from looking at your map what the slopes, hills, and valleys will look like on the ground.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1 (chap 6, p 6-1, para 6-2).

TEC Lesson 930-071-0016-F, Introduction to Land Navigation.

TASK

071-329-1005

Determine a Location on the Ground by Terrain Association

CONDITIONS

In the field during daylight hours, while at an unknown location on the ground, given a 1:50,000-scale military map of the area, a coordinate scale and protractor, a known point on the ground, and a requirement to determine the six-digit map coordinates of the location.

STANDARDS

Within 15 minutes, determine the six-digit grid coordinates of your location to within 100 meters.

PERFORMANCE MEASURES

1. Determine the four cardinal directions (north, south, east, and west).
2. Determine the type of terrain features on which you are located.
3. Determine what types of terrain features surround the location.
4. Orient the map.
5. Relate the terrain features on the ground to those shown on the map.
6. Having determined where the terrain features on the ground and those on the map coincide, determine the coordinate location of that point using the coordinate scale and protractor.

REFERENCES

TEC Lesson 930-071-0018-F, Navigating With Map and Compass.

TASK**071-329-1006**

**Navigate From One Position on the Ground
To Another Point**

CONDITIONS

Given a standard 1:50,000 scale military map, compass, a coordinate scale and protractor, and designated start and finish points no more than 3,000 meters apart. The field location of the task should appear on the military map and contain varying types of terrain. Weather conditions should not be considered a limiting factor.

TANDARDS

Within 1 hour, move from the start point to the finish point.

PERFORMANCE MEASURES

1. Locate the start point and finish point on the map and determine where the start point is on the ground.
2. Determine the grid azimuth from the start point to the finish point on the map.
3. Convert the grid azimuth to a magnetic azimuth.
4. Determine the distance between the start point and the finish point on the map.
5. Convert the map distance to pace count.
6. Place the azimuth between the start point and the finish point under the fixed black index line of the compass.
7. When planning the route between points, select terrain features that will be encountered by making a map reconnaissance.

8. Make mental checklist of such features.
9. Move to the start point to begin pace count.
10. While moving along the route, check against your "list."
11. After reaching the finish point, conduct a detailed terrain analysis to confirm your location.

REFERENCES

FM 21-26, Map Reading.

TEC Lesson 930-071-0018-F, Navigating with Map and Compass.

TASK

071-329-1007

Determine Distance While Moving Between Two Points on the Ground

CONDITIONS

Given a 600-meter pace course, a pace factor conversion table to determine your pace count, and a requirement to move by foot over varying types of terrain during daylight hours in all types of weather from a start point to a finish point not less than 500 meters nor greater than 700 meters in length.

STANDARDS

Determine the distance between the start point and finish point to within 5 percent of the actual distance in a maximum of 45 minutes.

PERFORMANCE MEASURES

1. When you have to go a certain distance on foot without any landmarks to guide you, you can measure distance pretty accurately by counting your paces. The average pace is just a little less than 1 meter. The average man uses 116 paces to travel 100 meters. You should check your pace length by practicing on a known 100-meter distance--like a football field plus one end zone, which is 110 yards (pretty close to 100 meters).

BEWARE: When you travel cross country like you do in the field, you use more paces to travel 100 meters--usually about 148 instead of 116. This is because you are not traveling over level ground, and you must use more paces to make up for your movement up and down hills. You should pace yourself over at least 600 meters of cross-country terrain in order to learn how many paces it takes you to travel an average 100 meters over cross-country terrain.

NOTE: Be sure you know how many paces it takes you to walk 100 meters both on level terrain and cross country. If you find that you don't take 116 paces in 100 meters, figure out how many paces you do take to go 100 meters.



The big problem in pacing is maintaining a straight line. At night the average man tends to walk in a circle if he doesn't use a compass. In daylight, you should use aiming points and a compass. Also, remember to figure only the *straight-line* distance when you have to walk around an obstacle.

Another problem is keeping count of paces taken. One way is to use pebbles. For instance, suppose you want to pace off one kilometer. (One kilometer is 1000 meters, or the distance between two of the black grid lines on your map.) Put 10 pebbles in your right pocket. When you go 100 meters move one pebble to your left pocket and start your count over. When all 10 pebbles have been moved to the left pocket, you have travelled one kilometer! Or, you can tie knots in a string—one knot per 100 meters.



2. Now let's work a sample problem.

PROBLEM: You are to move 715 meters.

- a. Your pace count for 100 meters is equal to 116 paces.
- b. Using the pebble method, you will need seven pebbles. This will take you 700 meters. But what about the other 15 meters?
- c. To determine how many paces it will take to go the remaining 15 meters, you simply multiply 15 meters by your pace count (116).
 - (1) $15 \times 116 = 1740$
 - (2) Mark out the last two numbers (40). The remainder is how many paces it will take to go 15 meters (17).
- d. So you would go 715 meters using the pebble method by pacing off 116 paces per 100 meters until all 7 pebbles were used, then go an additional 17 paces to arrive at 715 meters.

REMEMBER: When determining your number of paces to go, if it is not a multiple of 100, always multiply the meters remaining by your pace count and mark out the last two numbers in your result.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1.

TEC Lesson 930-071-0018-F, Navigation with Map and Compass.

TASK

071-329-1008

Measure Distance on a Map

CONDITIONS

Given:

1. A standard 1:50,000 topographic map on which is plotted:
 - a. Point A and point B, 3,000 to 4,000 meters apart.
 - b. Point C and point D, 3,000 to 4,000 meters apart on (trail) which changes direction at least twice.
2. A strip of paper with a straightedge.

STANDARDS

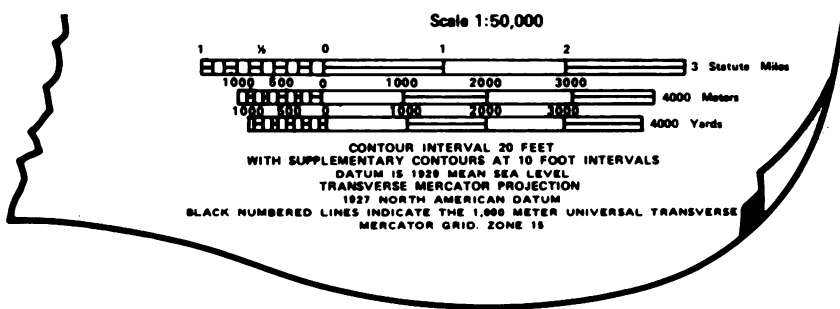
1. Determine the straight-line distance, in meters, from point A to point B within 50 meters in 3 minutes.
2. Determine the road (curved-line) distance from point C to point D within 100 meters in 3 minutes.

PERFORMANCE MEASURES

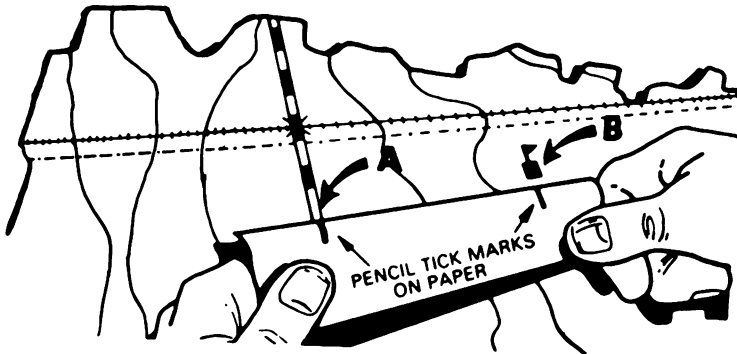
1. You can use your map to measure distance--how far it is between two places. The map is drawn to scale. This means that a certain distance on the map equals a certain distance on the ground. The scale is printed at the bottom and at the top of the map. This--Scale 1:50,000.
2. This means that 1 inch on the map equals 50,000 inches on the ground. In fact, any ground distance equals 50,000 times the distance on the map.

NOTE: Always check the scale before you try to measure distance, because different maps have different scales!

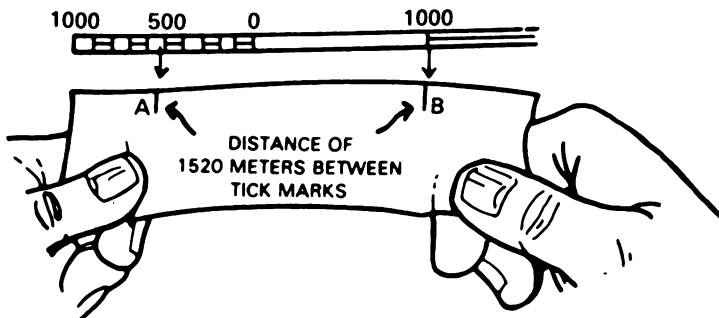
At the bottom of the map, you will also find three different bar scales which will help you to change map distance to miles, meters, or yards.



Take a ruler (straightedge) or the edge of a piece of paper and mark on it the straight line distance between your two points.



Then put the ruler or paper just under one of the bar scales and read the ground distance in miles, meters, or yards. The bar scale in the picture shows a ground distance of 1,520 meters.



Suppose you want to find the distance between A and B around a curve in a road. Take a strip of paper, make a small tick mark on it, and line up the tick mark with point A. Align the paper with the road edge until you come to the curve, make another mark on the paper and on the map, and then pivot the paper so it continues to follow the road edge. Keep repeating this until you get to point B. Always follow the road edge with your paper. Make a mark on your paper where it hits B and then go to your bar scales to get the distance.

Normally, you will be required to measure distance in meters, and you may receive a problem that goes off the bar scale. The meter bar scale allows you to measure distances up to 5,000 meters. If you have to measure distances greater than 5,000 meters, follow this procedure:

- a. Step A. Place your starting point on the paper under zero on the bar scale. Measure off 4,000 meters and place a new tick mark at that point on your paper.
- b. Step B. Place this second tick mark also under the zero on the bar scale and determine if the distance on the paper falls within the bar scale. If it does, add this value to 4,000 to give you your total distance. If it does not, repeat Step A until the distance on the paper falls within the bar scale. Remember to add this last value to the total number of meters you've already measured.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1 (chap 4, p 4-2, para 4-3).

TASK

071-329-1010

Determine Azimuths Using a Coordinate Scale and Protractor

CONDITIONS

Given a standard 1:50,000 scale military map, two known points plotted on the map, coordinate scale and protractor (C 5-2-9), a straightedge object, a pencil, and a requirement to determine the azimuth from your location (Point A) to another point (B) on the map.

STANDARDS

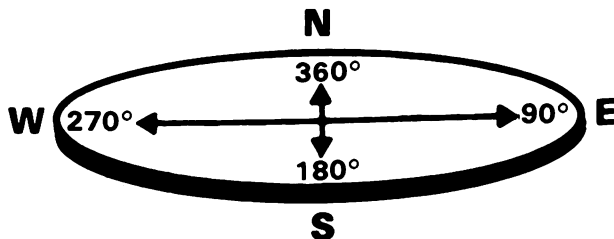
1. Determine the grid azimuth from your location (Point A) to Point B to within 1° in 3 minutes.
2. Determine the back azimuth of a given azimuth to the exact degree.

PERFORMANCE MEASURES

- The direction from one point to another point, either on the map or on the ground, has a military name:

AZIMUTH

- Azimuths are given in degrees in a clockwise direction. Since there are 360° in a circle, your azimuth can range from 1° up to 360° . Due east is 90° , due south is 180° , due west is 270° , and due north is 360° .



SKILL LEVEL 1

3. To get the right azimuth from a map, you have to use a protractor. Here is how to use your protractor to determine azimuth:
 - a. Determine your location (Point A) and the location of the point (B) on the map (fig 1).
 - b. Draw a straight line from Point A to Point B.
 - c. Place the index of the protractor over center of mass of A with the 0° on the protractor at the top and 90° at the right.
 - d. Start at the 0° point on the protractor and read to the point in a clockwise manner until reaching the point where the straight line intersects the protractor scale.
 - e. Read the azimuth in degrees from the protractor-- 210° .

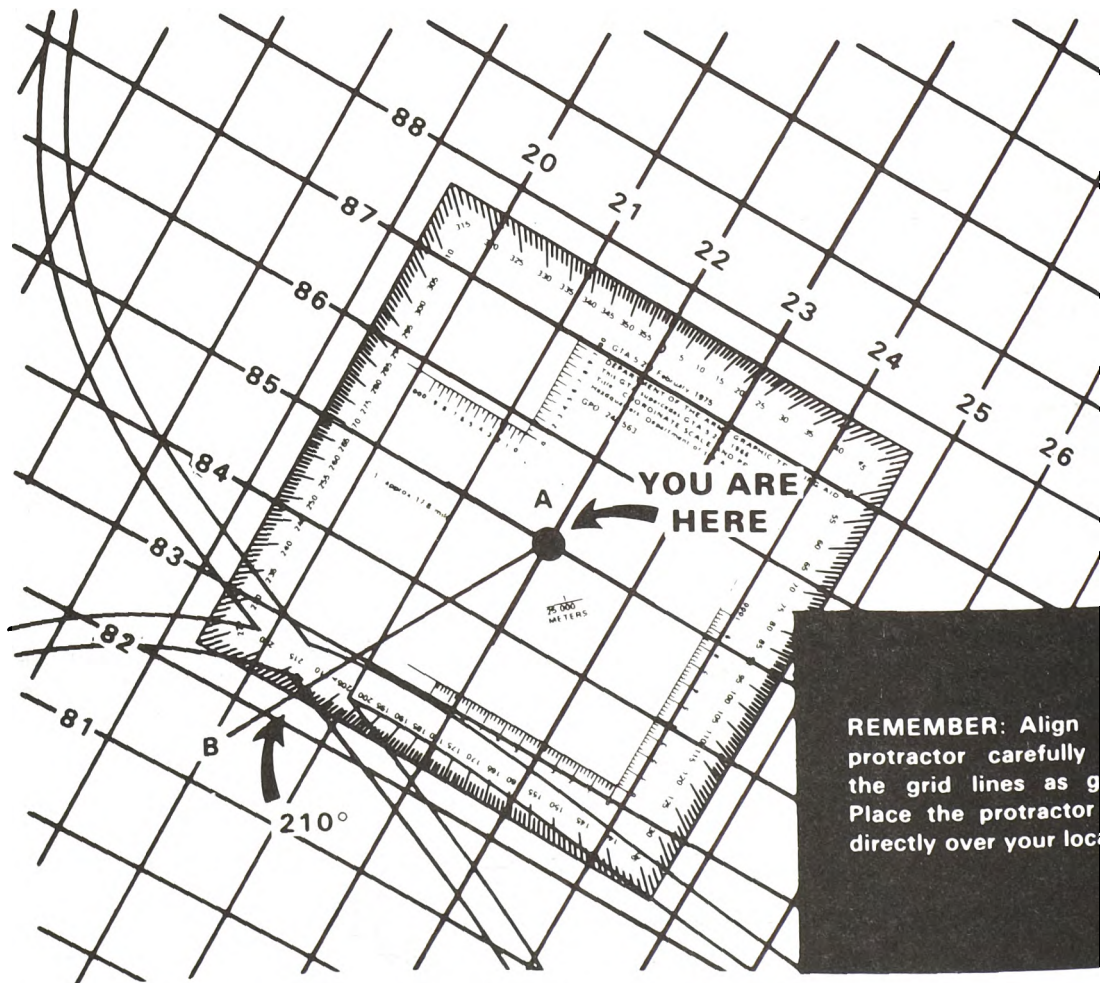


Figure 1. Using a protractor to determine an azimuth.

Suppose you follow the 210° azimuth in figure 1 to the road junction and then want to go back to your original location. To do this, you take a BACK AZIMUTH. You simply subtract 180° from the first azimuth. Your back azimuth is $210^\circ - 180^\circ = 30^\circ$.

If you can't subtract 180° because your first azimuth is too small, then just add 180° . For example, if your azimuth was 40° , you know that you can't subtract 180° , so you add 180° . The back azimuth would be $40^\circ + 180^\circ = 220^\circ$.

REMEMBER: A back azimuth goes in the opposite direction from an azimuth.

Can you figure out the back azimuth of 290° ?

How about the back azimuth of 75° ?

Check your answers with the correct answers listed below.

ANSWERS: The back azimuth of 290° is 290° minus 180° , which is 110° . The back azimuth of 75° is 75° plus 180° , which is 255° .

REFERENCES

M 21-26, Map Reading, 20 Jan 69, w/C1.

EC Lesson 930-071-0014-F, Measuring Distances and Azimuths.

5-2-9, Map Reading Coordinate Scales and Protractor.

TASK

071-329-1011

Orient a Map Using a Compass

CONDITIONS

Given a standard 1:50,000-scale military map and lensatic compass in a field environment, under daylight conditions.

STANDARDS

Within 1 minute, orient the map to the ground using a compass so that the north-seeking arrow of the compass is within 3 degrees of the angle shown in the G-M angle of the declination diagram shown on the map.

PERFORMANCE MEASURES

1. With the map in a horizontal position, the compass is placed parallel to a north-south grid line with the cover side of the compass pointing toward the top of the map. This will place the black index line on the dial of the compass parallel to grid north. When the needle on the compass points to magnetic north, the angle between the black index line and the compass needle, as shown in the declination diagram on the face of the compass, is the G-M angle.
2. Rotate map and compass until the directions of the black index line and the compass needle match the directions shown on the declination diagram printed in the margin of the map. The map is then oriented.
3. If the magnetic north arrow on the map is to the left of grid north, the compass reading will equal the G-M angle (given in the declination diagram). If the magnetic north is to the right of grid north, the compass reading will equal 360° minus the G-M angle.
4. Remember to point the compass north arrow in the same direction as the magnetic north arrow (2 above), and the compass needle (equal to the G-M angle or the 360° minus G-M angle) will be parallel to the black index line.

5. Some maps have a built-in protractor consisting of a pivot point "P" on the south neatline of the map and several degrees of arc along the north neatline of the map. The G-M line is obtained by connecting pivot point "P" with the appropriate value of the G-M angle (taken from the declination diagram) on the arc. The map may then be oriented by placing the compass parallel to this line and rotating the map and compass until the needle point is aligned with the continuous line formed by the index line and the sighting wire. The map is then oriented.
6. An alternate method is to draw a magnetic north line on the map from any N-S and E-W grid line intersection using the protractor. Align the straightedge of the compass along this magnetic north line and rotate the map and compass together until the north arrow falls beneath the fixed black index line on the compass.

NOTE: If G-M angle is less than 3 degrees, do not line up north arrow.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1 (chap 5, p 5-10, para 5-7).

TASK

071-329-1012

Orient a Map to the Ground by Map-Terrain Association

CONDITIONS

Given a standard 1:50,000 scale military map in a field site under daylight conditions.

STANDARDS

You must orient the map to north within 30° in 10 minutes.

PERFORMANCE MEASURES

There are many good ways that you can use to locate your position on your map, but first you have to do one important thing.

You've got to point your map so that NORTH, SOUTH, EAST, and WEST on the map POINT THE SAME WAY as they do on THE GROUND.

THIS IS CALLED ORIENTING YOUR MAP!

Look at the map and the ground to find two linear features on both, such as hilltops, saddles, valleys, ridges, and depressions. Then, by aligning the features on the map with the same feature on the ground (fig 1 and 2) the map is oriented.



Figure 1. An area as viewed from a ground position.

Figure 2. Map of the same area as in figure 1.



Figure 1. An area as viewed from a ground position.

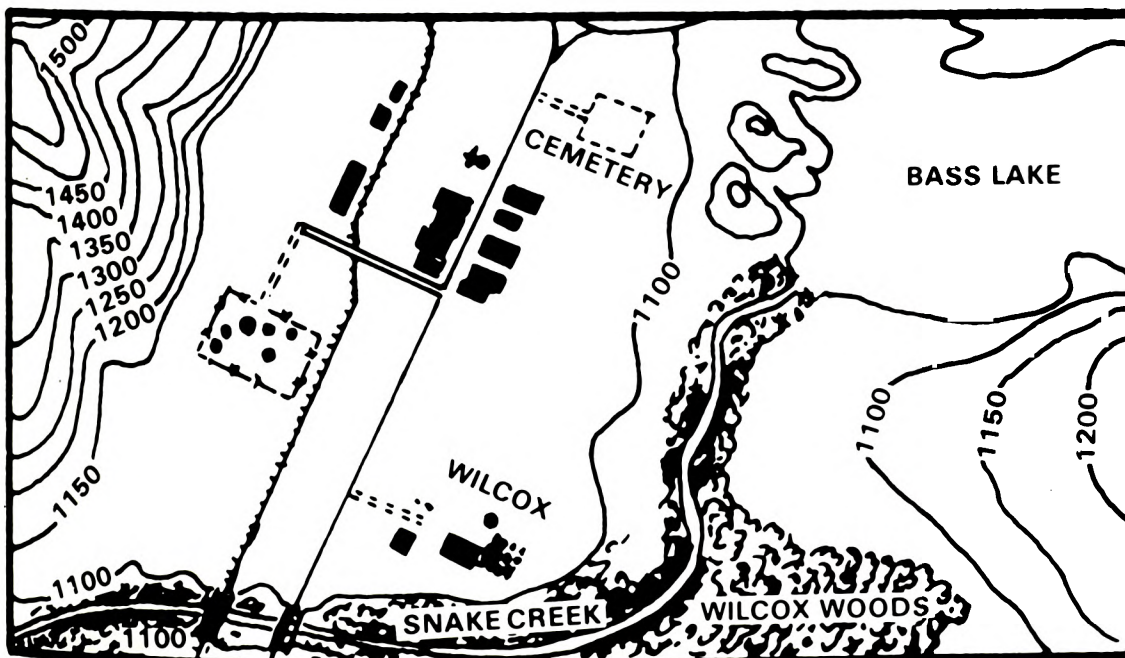


Figure 2. Map of the same area as figure 1.

REFERENCES

FM 21-26, w/C1, Map Reading, (chap 5, p 5-10, para 5-7), Jan 69.

TASK

071-331-0801

Use Challenge and Password

CONDITIONS

Given current challenge and password and a defensive position designated sector of fire. Soldier will be told that enemy and personnel may enter his sector and that he is to allow friendly personnel to pass only if they respond with correct password. He is to detain or capture other personnel as he is able.

STANDARDS

Soldier will:

1. Detect and halt personnel in his sector.
2. Challenge them with correct challenge.
 - a. If given correct password, allow personnel to pass.
 - b. If not given correct password, attempt to detain or capture personnel as he is able.

PERFORMANCE MEASURES

If one person desires to pass:

1. Upon seeing or hearing someone approach your position before he gets close enough to pose a threat, command "Halt!" Use a clear voice, just loud enough to be heard.
2. When the stranger halts, keep him covered and without leaving your position, ask "Who is there?" Again, use a clear voice just loud enough to be heard so the enemy won't overhear nearby.

3. When the stranger identifies himself, such as "Private Willard, Messenger," you order him to "Advance to be recognized."
4. Maintain your concealed position and keep the stranger covered with your weapon. When the stranger gets within 2 or 3 meters of you, again order him to "Halt!"
5. Issue the challenge in a soft voice and wait for the stranger to reply with the correct password. Hearing the correct password, give permission to pass if you have no other reason for doubt. If doubt still exists, demand further identification or ask a question only a friendly person would be able to answer.

If a group desires to pass:

6. The procedure and precautions for a group are almost the same as for one person. Seeing or hearing a group approach, before they are close enough to pose a threat, order them to "Halt!"
7. The leader of the group should identify the group, such as "Friendly Patrol." Since you don't want the whole group to advance on you at once, order "Advance one man to be recognized."
8. When the leader has come forward to be recognized, give him the challenge and get the password in reply.
9. Once you're satisfied that the leader is friendly, have the rest of the patrol advance one by one and let the leader identify each person.
10. Persons not able to give the proper password or identify themselves to your satisfaction are disarmed and detained. Then notify your immediate superior.

REFERENCES

FM 21-75, Combat Training of the Individual Soldier and Patrolling, Jul 67, w/C1.

FM 22-6; Guard Duty, Sep 71, w/C1 (chap 9, pp 9-1 and 9-2; app F, pp F-1 thru F-4).

TEC Lesson 935-071-1029-F, Counterintelligence.

TASK

071-331-0852

Clear Fields of Fire

CONDITIONS

Given a partially completed fighting position with an assigned sector of fire, containing thick underbrush and small to medium trees, a trenching tool, an axe, a specified depth or field of fire to be cleared, and a designated amount of time in which to clear the field of fire.

STANDARDS

Within designated time, clear your sector of fire out to the specified distance so that:

1. Anyone moving through your sector of fire can be seen from your position.
2. Anyone moving into your sector of fire will not recognize the cleared area.

PERFORMANCE MEASURES

Clearing fields of fire.

1. In preparing defensive positions for expected contact with enemy, clear suitable fields of fire in front of each position.

2. The following principles must be observed:
 - a. Do not disclose your position by excessive or careless clearing.



WRONG— TOO MUCH CLEARING, DEBRIS
NOT REMOVED ENEMY WILL AVOID



ORIGINAL TERRAIN



WRONG—AFTER IMPROPER CLEARING



RIGHT— ONLY UNDERBRUSH AND TREES DIRECTLY
IN LINE OF FIRE REMOVED, ENEMY SURPRISED



RIGHT— AFTER PROPER CLEARING

SKILL LEVEL 1

- b. In areas organized for close defense, start clearing near position and work forward.
- c. In all cases, leave a thin natural screen of vegetation near defense positions.
- d. In sparsely wooded areas, remove lower branches of scattered trees.
- e. In heavy woods, complete clearing of the field of fire may be possible or desirable within the time available. Work to thinning undergrowth and removing lower branches of large trees. Clear narrow lanes of fire for automatic weapons, making sure that you clear in an irregular pattern so as not to reveal the weapons' positions.
- f. Remove or thin dense brush which is never a suitable cover and obstructs the field of fire.
- g. Cut weeds only where they obstruct your view.
- h. Drag away cut brush, limbs, and weeds to points where they will not be detected by the enemy or furnish him concealment.
- i. Cover cuts on trees and brushes forward of the position with mud, dirt, or snow.
- j. Insure that no trails are made in your sector of fire and that all areas are cleared.

REFERENCES

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77 (p 5-33).

TASK**081-831-1001**

Perform Mouth-to-Mouth Resuscitation

CONDITIONS

Given a soldier who is apparently unconscious and not breathing.

STANDARDS

Check for breathing and consciousness. If not breathing or conscious, start resuscitation immediately and continue as long as there is a pulse, until the soldier breathes on his own, until relieved by medically trained personnel, or until too exhausted to continue.

PERFORMANCE MEASURES

1. Shake the soldier's shoulder and shout, "Are you o.k.?" If soldier answers, resuscitation is not needed.
2. If the soldier does not answer, call for help in order to have assistance.
3. Roll soldier on his back.
4. Kneel near the soldier's shoulders.
5. Tilt the soldier's forehead back and lift his neck as shown in figure 1. This should open the airway.
6. Pinch the soldier's nose closed as shown in figure 1.
7. Check for breathing by placing your ear near his mouth while looking at his chest. You can then see if the chest rises and falls, and feel or hear his breathing. If soldier is breathing, then mouth-to-mouth resuscitation is not necessary.

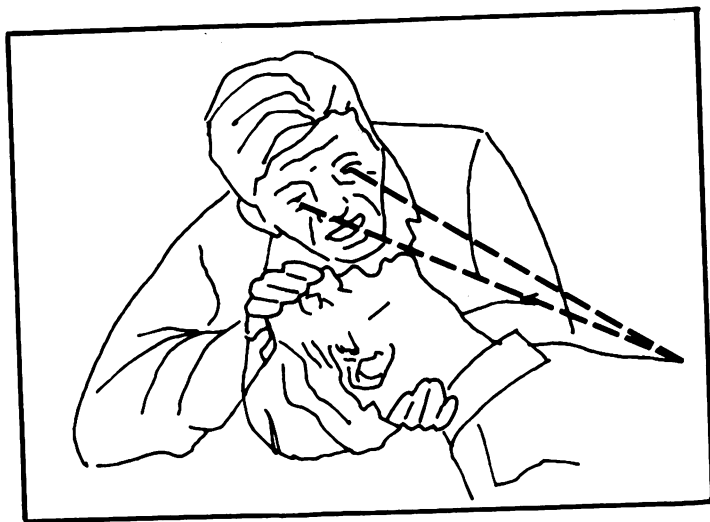


Figure 1.

8. If the soldier is not breathing, place your mouth completely over the soldier's mouth to make an air-tight seal while continuing to hold the nose closed.
9. Blow four full, quick breaths, not allowing the soldier to completely exhale between breaths.

CAUTION: If the soldier's chest does not rise, or you feel strong resistance to your first breath, the soldier's airway may be clogged. You should then do the following steps:

- a. First raise the soldier's neck more and again blow four, forceful, quick breaths.
 - b. If airway still seems clogged, look in the mouth and take out any false teeth, foreign matter, or pull out his tongue (if he swallowed it). Again try to blow four forceful, quick breaths.
 - c. If airway still seems clogged, do the Heimlich Maneuver (Task 081-831-1003). The clog must be cleared.
10. After the fourth breath, release the nose.
 11. Immediately check the soldier's neck for a pulse. The pulse should be found in the soft area between the Adam's apple and the large muscle on the side of the neck (fig 2).

NOTE: If pulse is found, continue resuscitation only. If pulse is not found, you will have to do CPR (see steps 18 through 19, Task 081-831-1002).

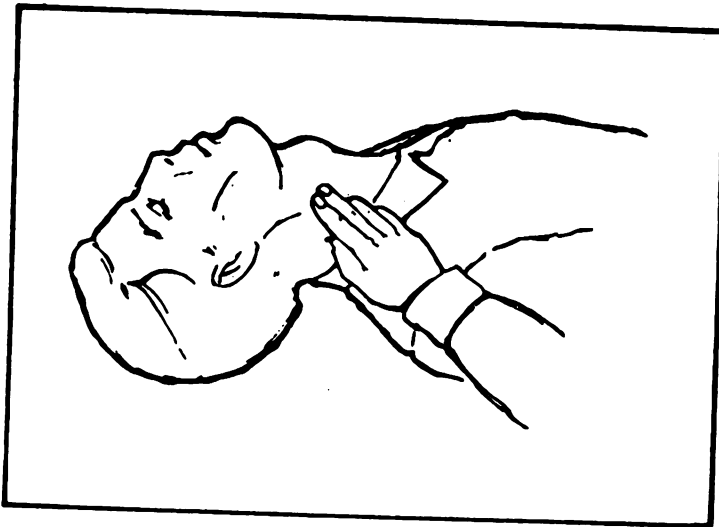


Figure 2

12. Blow breaths into the soldier about once every 5 seconds (12 times a minute), checking to see that his chest rises with each breath.

NOTE: Let the soldier's chest fall after each breath.

13. Check the soldier's pulse once a minute (as in step 11) or every 12 breaths.

CAUTION: If soldier's stomach begins to bulge, do not try to deflate the bulge as this may cause vomiting. If the soldier does vomit, turn his head to the side to drain the vomit from his mouth.

14. Continue resuscitation (steps 11 and 12 above) until:
 - a. the soldier breathes on his own, or
 - b. you are relieved by medically trained personnel, or
 - c. the soldier's pulse stops and you must also do CPR (steps 12 through 19 of CPR, Task 081-831-1002), or
 - d. you are exhausted and can no longer continue.

REFERENCES

None.

TASK

081-831-1002

Perform Cardiopulmonary Resuscitation (CPR) Using One Man Method

CONDITIONS

Given a soldier who is apparently not breathing and apparently no pulse.

STANDARDS

Check for breathing, pulse, and consciousness. Perform cardiopulmonary resuscitation (CPR) in accordance with performance measures. Continue until soldier is breathing on his own or until relieved by medic.

PERFORMANCE MEASURES

1. Shake the soldier's shoulder and shout, "Are you okay?" If the soldier answers, resuscitation is not needed.
2. If the soldier does not answer, call for help in order to get assistance.
3. Roll soldier on his back.
4. Kneel near the soldier's shoulders.
5. Tilt the soldier's forehead back and lift his neck as shown in figure 1. This should open the airway.
6. Pinch the soldier's nose closed as shown in figure 1.
7. Check for breathing by placing your ear near his mouth and looking at his chest. You can then see if the chest rises and falls, and feel or hear his breathing. If the soldier is breathing, mouth-to-mouth resuscitation is not necessary.



Figure 1.

8. If the soldier is not breathing, place your mouth completely over the soldier's mouth to make an air tight seal while continuing to hold the nose closed.
9. Blow four full, quick breaths, not allowing the soldier to completely exhale between breaths.

CAUTION: If the soldier's chest does not rise or you feel strong resistance to your first breath, the soldier's airway may be clogged. You should then do the following steps:

- a. First raise the soldier's neck more and again try four, forceful, quick breaths.
 - b. If airway still seems clogged, look in the mouth and take out any false teeth, foreign matter, or pull out his tongue (if he swallowed it). Again try four, forceful, quick breaths.
 - c. If airway still seems clogged, do the Heimlich Maneuver (task 081-831-1003). The clog must be cleared.
10. After the fourth breath release the nose.

11. Immediately check the soldier's neck for a pulse. The pulse should be found in the soft area between the Adam's apple and the large muscle on the side of the neck. (Figure 2).

NOTE: If pulse is found but soldier is not bleeding, continue resuscitation only (steps 12, 13, and 14 of the procedure 081-831-1001). If no pulse is found, do the following steps.

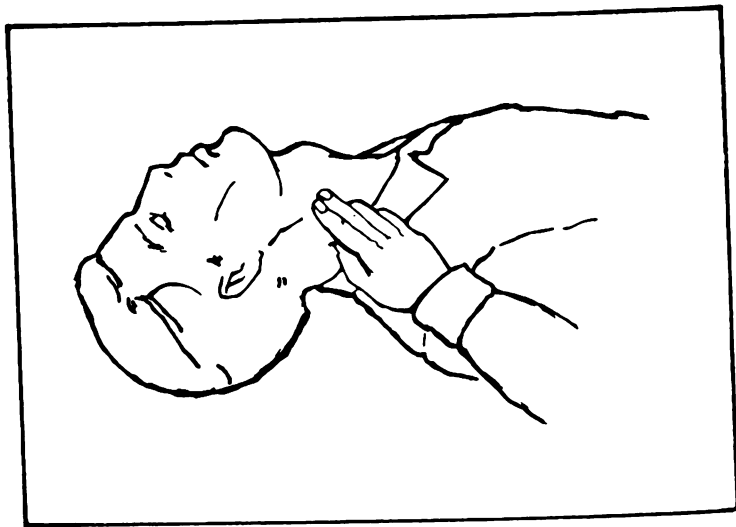


Figure 2.

12. Locate the bottom of the soldier's breastbone as shown in figure 3. The bottom of the breastbone can be located by feeling for the space just below the ribs just below the breastbone.
13. Place your hands over the bottom of the breastbone as shown in figure 4.
14. Place your shoulders directly over the soldier's breastbone, your arms straight with your fingers raised off the chest, and push straight down (figure 4).

NOTE: Apply only enough pressure to push the breastbone down 1 1/2 to 2 inches. When lifting back up, do not lift your hands off of the chest. Do not bounce or rock.

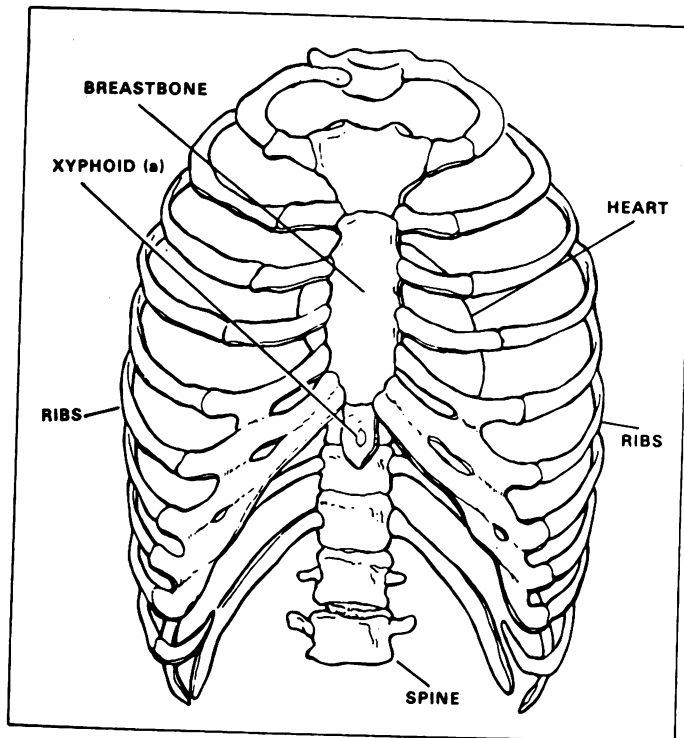


Figure 3.

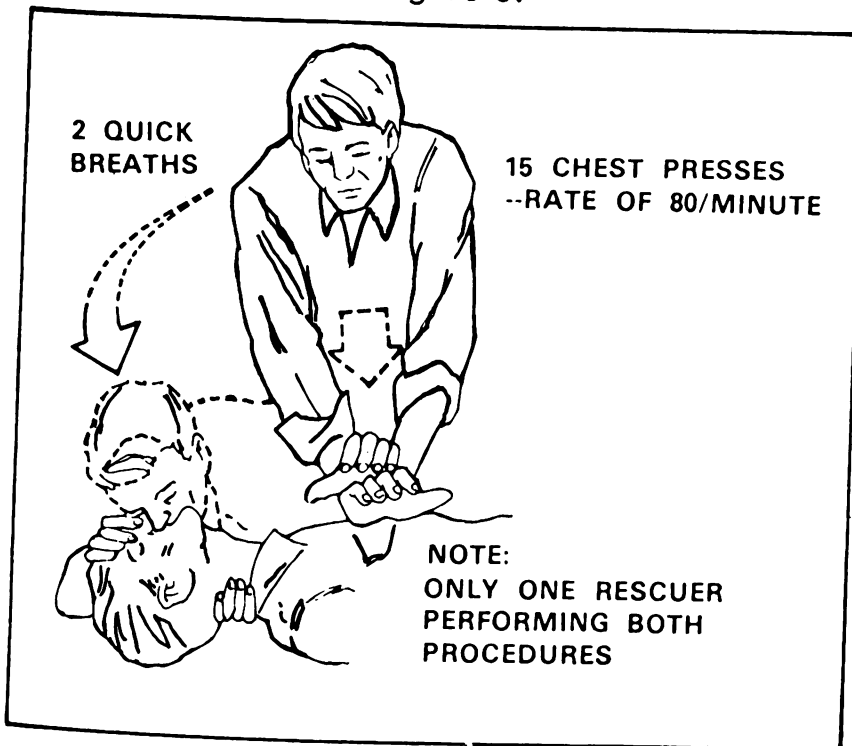


Figure 4.

SKILL LEVEL 1

15. Press down on the chest 80 times per minute. Chest presses should be done in groups of 15 to the count of "one and two and three and four and five . . . and fifteen."
16. After every 15 chest presses, blow two full, forceful breaths into the soldier's mouth as shown in figure 4. Allow the soldier's head to fall after each breath.
17. Go back to doing chest presses exactly as before (see steps 13 through 16). After each group of 15 chest presses, blow two full, forceful breaths into the soldier's mouth.
18. After doing four repetitions of 15 chest presses and two full breaths, check the soldier's pulse. Take no longer than five seconds to do so.

NOTE: If a pulse is felt, stop the CPR for no longer than five seconds to be sure that the pulse is due to the soldier's heart beating and not from the CPR. If the pulse disappears continue with CPR.

19. Continue CPR (steps 13 to 18) until:
 - a. The soldier breathes on his own, or
 - b. You are relieved by medically trained personnel, or
 - c. You are exhausted and can no longer continue.

NOTE: If the soldier has a pulse but is not breathing, then continue with mouth-to-mouth resuscitation.

REFERENCES

None

TASK

081-831-1003

Clear an Airway Using Heimlich Maneuver

CONDITIONS

Given a soldier who is choking.

STANDARDS

Clear the airway.

PERFORMANCE MEASURES

Steps to clear the airway:

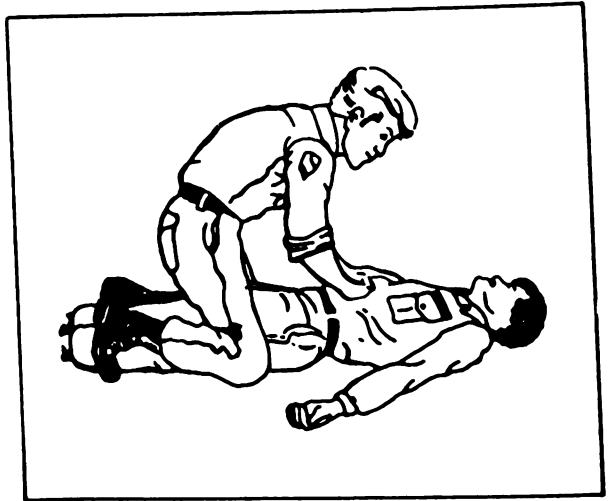
1. When soldier is sitting or standing.
 - a. Stand behind soldier.
 - b. Wrap your arms around soldier's waist under his arms as shown.



- c. Make a fist with one hand and put it on the soldier just below the ribs and above the navel.
- d. Grab your fist with your other hand.
- e. Press fist into the soldier's stomach, with a forceful upward thrust. Allow the soldier time to inhale in order to get air in the lungs; then, repeat if necessary.
- f. Do step e until the soldier stops choking.

NOTE: If the victim vomits, turn his head to the side and wipe his mouth so he will not choke on vomit.

- 2. When soldier is lying on his back.
 - a. Kneel (straddle) over his hips facing his head.



- b. Make a fist with one hand and put it on the soldier just below the ribs and above the navel.
 - c. Put your other hand on your fist.

- d. Push fist into the soldier's stomach, with a fast, upward thrust. Allow the soldier time to inhale in order to get air in the lungs, then repeat if necessary.
- e. Do step d until the soldier stops choking.

When soldier is on his side or stomach, roll him onto his back and follow steps in 2.

REFERENCES

M 21-11, First Aid for Soldiers, chap 4-14, Jun 76.

TASK

081-831-1004

Apply First Aid Measures to Stop Bleeding

CONDITIONS

Given a soldier with a bleeding wound.

STANDARDS

Stop or control the bleeding in accordance with the measures.

PERFORMANCE MEASURES

1. Stop bleeding using pressure.
 - a. Check to make sure the soldier is breathing.

NOTE: If he is not breathing or does not heartbeat, open the airway and restore breath heartbeat as explained in task 081-831-1002, Cardiopulmonary Resuscitation.

- b. Apply a first aid dressing according to the instructions on the dressing package (fig 1).

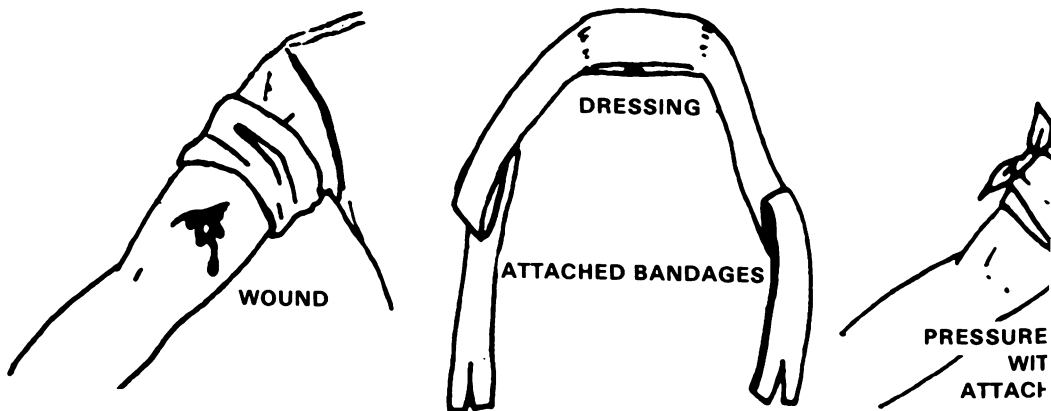


Figure 1. Application of first-aid dressing.

NOTE: Raising the injured limb above the level of the heart will help to control the bleeding. Use the soldier's helmet, pack, or other object to keep the injured limb elevated.

NOTE: You may need to press hard on the first aid dressing with your hand to help control the bleeding. You may have to press for 5 to 10 minutes to allow a clot to form (fig 2).

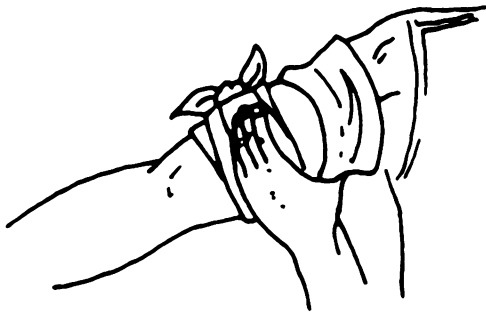


Figure 2. Pressing hand on dressing to help control bleeding.

c. If the bleeding does not stop:

- (1) Put additional pressure on the wound by placing a thick wad of padding (socks, handkerchief, etc.) on top of the first aid dressing at the location of the wound (fig 3).

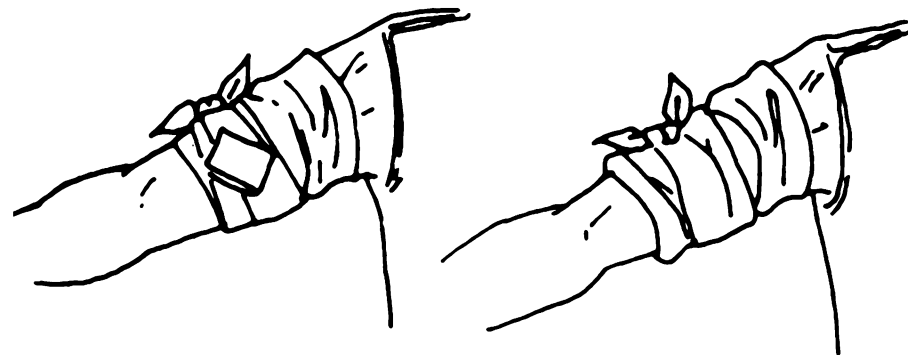


Figure 3. Padding placed on dressing for pressure.

- (2) Tie this wad firmly in place using a strip of cloth material.

NOTE: Continue to use hand pressure and elevation.

NOTE: The use of pressure as described in 1, above, will control the bleeding from wounds.

2. Stop bleeding using a tourniquet.

CAUTION: A tourniquet is the most extreme method of stopping bleeding. The use of a tourniquet can cause severe damage to blood vessels and nerves and can cause the loss of an arm or leg. The only time you should ever apply a tourniquet is when an arm or leg has been cut off or when there is very heavy bleeding that cannot be stopped by the pressure methods described above.

- a. Place the tourniquet. The tourniquet must be applied above the wound and the heart. The object is to stop the bleeding and save as much of the arm or leg as possible.

- (1) If an arm or leg has been cut off below the elbow or the knee:

Place the tourniquet above the elbow joint or above the knee. Get good bleeding control and to keep the tourniquet from slipping off.

- (2) If the arm or leg has been cut off above the elbow or the knee: Place the tourniquet as close as you can to the wound and still be able to get a firm hold on it. Make sure the leg so that the tourniquet will not slip off.

CAUTION: If only part of a hand or foot has been cut off, you should stop the bleeding by using the pressure methods.

- (3) If a wound is bleeding very heavily and you are unable to stop the bleeding using the pressure methods:

Place the tourniquet as close as you can to the wound.

b. Tighten the tourniquet.

- (1) Tie the tourniquet, using a square knot as shown in figure 4.

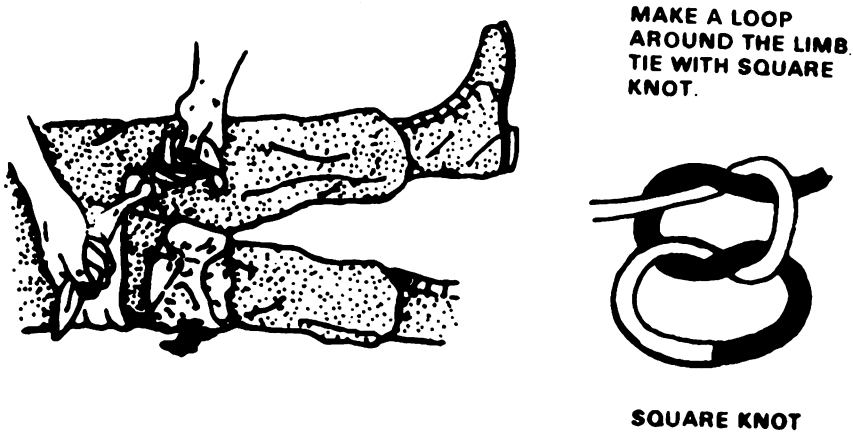


Figure 4. Tying tourniquet.

- (2) Place a rigid object, such as a stick, between the wound and the tourniquet, as shown in figure 5.

PASS A STICK,
SCABBARD, OR
BAYONET UNDER
THE LOOP.



Figure 5. Placing stick in tourniquet.

- (3) Twist the stick to tighten the tourniquet just enough to stop the bleeding as shown in figure 6.



BIND FREE END
OF STICK TO
LIMB TO KEEP
TOURNIQUET
FROM UNWINDING

Figure 6. Twisting stick to tighten tourniquet.

- c. Check the soldier's pulse at the wrist or ankle of arm or leg. If you cannot feel the pulse, the tourniquet is not tight enough.
- d. Tie the tourniquet to the injured arm or leg to prevent unwinding as shown in figure 7.

TIGHTEN TOURNIQUET
JUST ENOUGH TO
STOP ARTERIAL
BLEEDING.

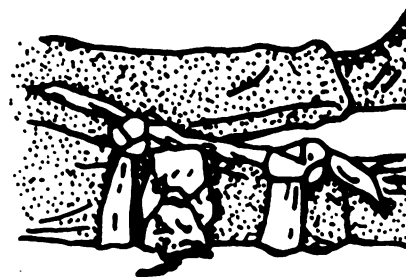


Figure 7. Stick tied to leg to prevent unwinding.

CAUTION: The tourniquet must be tied to keep it from slipping or unwinding.

- e. Mark on the soldier's forehead, if possible: a T and the time the tourniquet was applied.
- f. Get the soldier to medical help as soon as possible.
- g. Keep the soldier from chilling or overheating, depending on the weather. If you must cover him, leave the tourniquet uncovered so it can be easily seen.

CAUTION: DO NOT LOOSEN THE TOURNIQUET AFTER IT HAS BEEN APPLIED.

REFERENCES

FM 21-11, First Aid for Soldiers, chap 4, pp 29 thru 35, Jun 76.

TASK

081-831-1005

Give First Aid to Prevent Shock

CONDITIONS

Given an injured soldier who may be showing signs of shock

STANDARDS

Give first aid to prevent shock in accordance with measures.

NOTE: Shock as the result of an injury is usually caused by loss of blood. If a soldier appears to have injury but is in shock, he either lost a lot of blood you saw him or he has internal bleeding from another injury.

PERFORMANCE MEASURES

1. Identify signs of shock.
 - a. The soldier who is in the early stages of shock may
 - (1) Restless
 - (2) Thirsty
 - (3) Sweaty, but have cool skin
 - (4) Pale
 - (5) Showing signs of a rapid pulse
 - b. Soldiers in a more severe stage of shock may:
 - (1) Have a rapid pulse

- (2) Have lost a large amount of blood
- (3) Be breathing with short fast breaths or gasps
- (4) Have bluish skin, especially around the mouth
- (5) Be unconscious with deep slow breathing

Insure the soldier can breathe and has a heartbeat (pulse). You may have to:

- a. Clear the soldier's airway (task 081-831-1001).
- b. Lay the soldier with head turned to the side to drain any fluid in his airway.
- c. Give the soldier cardiopulmonary resuscitation (CPR) (task 081-831-1002).

Stop bleeding (task 081-831-1004).

Lay the soldier on his back with feet raised 12 inches higher than his head.

Splint fractures (task 081-831-1006).

Prevent chilling or overheating, depending on the weather.

Keep the injured soldier calm by:

- a. Being calm yourself
- b. Being gentle yet firm in your actions
- c. Not volunteering any information about his injury

Give the soldier water unless he has a stomach, neck or head wound.

ENCES

21-11, First Aid for Soldiers, pg 36 thru 39, paragraph 5-1 thru , Jun 76.

TASK

081-831-1006

Splint a Suspected Fracture

CONDITIONS

Given a soldier who has a suspected fracture. Required: Any material available for making a splint (poles, sticks, boards, etc.), padding material (socks, clothing, etc.), (belts, strips of cloth, etc.).

STANDARDS

Splint the suspected fracture without cutting off blood flow so that the joints above and below the fracture cannot be moved.

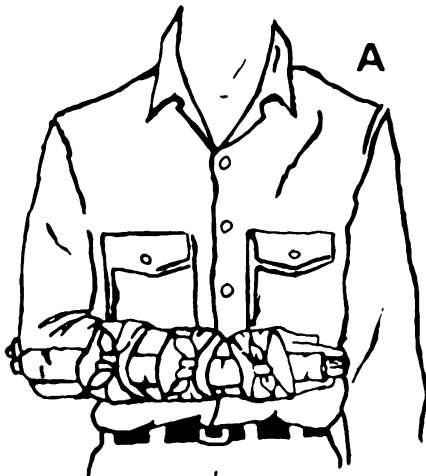
PERFORMANCE MEASURES

1. Check for other injuries and perform any necessary first aid measures.

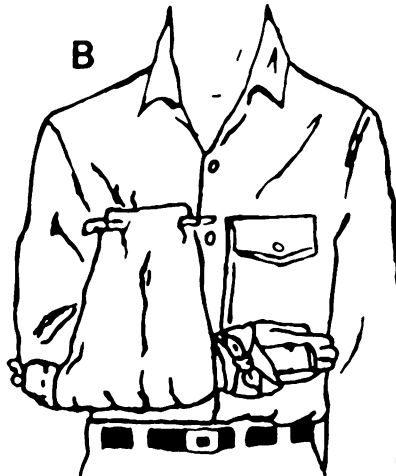
NOTE: Try not to move soldier, unless absolutely necessary, until the suspected fracture is splinted.

NOTE: Cover any wound with a sterile dressing or handkerchief.

2. Loosen clothes, but do not move the fractured part.
3. Get splints, padding, and bandages. Make sure they are tight enough to immobilize the joints above and below the fracture.
 - a. When no materials are available to splint a fracture, the victim's uninjured leg may be used as a splint for the fractured leg, following the performance



STICKS ROLLED IN MATERIAL
FROM CLOTHING OR BLANKET



TAIL OF SHIRT



STRIP FROM CLOTHING OR BLANKET

Figure 1. Fractured forearm or wrist splinted with sticks and supported with tail of shirt and strips of material.

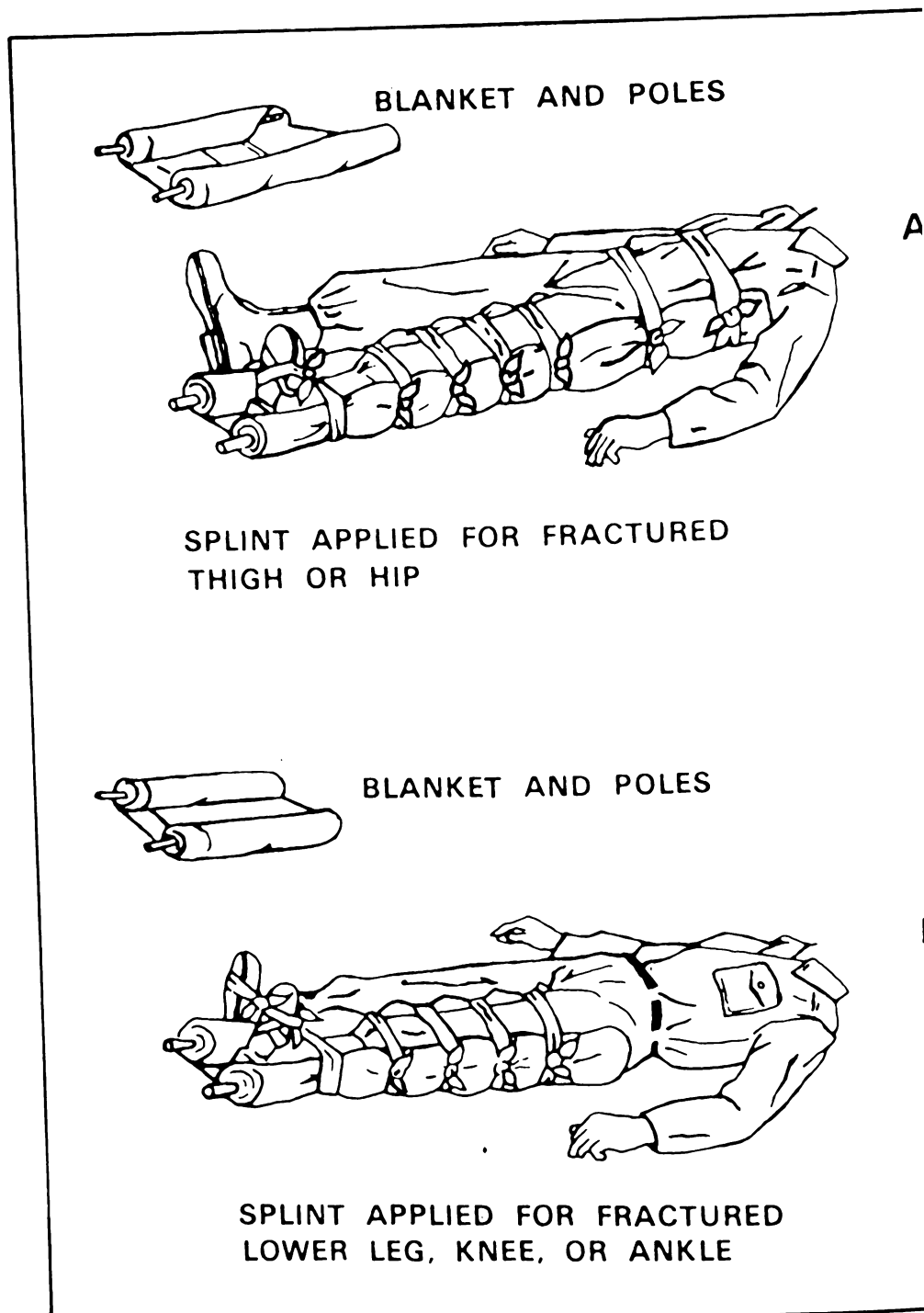


Figure 2. Application of splints to lower extremity fractures, rolled in a blanket.

- b. When the victim has suspected fracture of the ankle, the boot acts as a splint and should not be removed.
- 4. Pad and splints. This is especially important when the splint will touch bony areas (elbow, wrist, knee, or ankle) or the crotch area or armpit. If padding material is not available, splint without padding.
- 5. Put on the splint with the fractured arm or leg in as normal a position as possible. See figures 1 and 2.

NOTE: If suspected fracture is at or near a joint, or the bone is in an unnatural position, do not attempt to move the joint or straighten the bone. Splint in the position found.

- 6. Tie splint securely in place with strips of cloth.
 - a. Tie splint above and below the suspected fracture as shown in figure 1 and 2. Do not tie a cloth directly over the fracture.
 - b. Tie all bandages so that knot is against the splint. Do not tie splints too tight.
- 7. Check the pulse below the fracture site. Loosen bandages if pulse cannot be detected.
- 8. Get soldier to medical help as soon as possible. Keep him warm.

NOTE: Watch soldier for signs of shock. See task 081-831-1005, Give first aid to prevent shock, for additional first aid measures.

REFERENCES

- 1. 21-11, First Aid for Soldiers, para 8-1 thru 8-11, pp 64-83, Jun

TASK

081-831-1007

Give First Aid for Burns

CONDITIONS

Given a soldier with burn(s). Required equipment: Individual first aid case.

STANDARDS

Give first aid as described in the performance measures.

NOTE: Many things cause burns: fire, explosions, chemicals, the sun, electricity, lasers, etc. First aid is the same for all, except that some chemical burns need special treatment.

PERFORMANCE MEASURES

1. Cover the burn with a sterile dressing from the individual first aid case. (Clean cloth can be used if dressing is not available.)

CAUTION: Before covering burns, DO NOT:

- a. Pull off pieces of cloth which are stuck to the burn.
- b. Attempt to clean the burn in any way.
- c. Pull clothing over the burned area.
- d. Break blister.
- e. Apply ointments or medications.

NOTE: If burn was caused by a chemical, pour large amounts of water over the burned area immediately after covering.

This soldier may have water unless he is:

- a. Unconscious.
- b. Vomiting or nauseated.
- c. Wounded in the stomach or neck.

Give first aid to prevent shock (task 081-831-1005).

Move (evacuate) soldier to medical help as soon as possible.

REFERENCES

One

TASK

081-831-1008

Give First Aid for Heat Injuries

CONDITIONS

On a hot day or in a hot area, given a soldier with heat injury. Required equipment: canteen full of water, salt tablets.

STANDARDS

Identify the heat injury according to the symptoms and according to the performance measures.

PERFORMANCE MEASURES

1. Heat Cramps.

- a. Signs/symptoms - muscle cramps in stomach, legs, arms.
- b. Give first aid.
 - (1) Move soldier to cool area and loosen clothing.
 - (2) Give the soldier two salt tablets and have him drink canteen of cool water.

NOTE: If salt tablets are not available, give a teaspoon of table salt in the canteen of water.

CAUTION: Have the soldier drink the water slowly. Do not give salt tablets unless you give the soldier at least a half canteen of water.

- (3) Instruct the soldier to increase the amount of water with his rations.

2. Heat Exhaustion.

a. Signs/symptoms include:

- (1) Cool, moist skin;
- (2) Headache;
- (3) Weakness;
- (4) Dizziness;
- (5) Nausea;
- (6) Muscle cramps, especially in the lower legs.

b. Give first aid.

- (1) Move soldier to a cool area, have him lie down, and loosen his clothing;
- (2) Raise his feet about 12 inches;
- (3) Give salt and water as described in 1b above.

3. Heatstroke.

a. Signs/symptoms include:

- (1) Soldier's skin is hot to the touch, but he may not be sweating;
- (2) Unconsciousness -- usually occurs very quickly after earlier signs of:
 - (a) dizziness
 - (b) headache
 - (c) sick to the stomach
 - (d) mental confusion

b. First aid.

- (1) Put the soldier in water, if there is a source of water. The water should be as cold as possible. If there is not enough water to put him in --

- (2) Move the soldier to a cool area, remove his clothing, and pour cold water over him while fanning his body.
- (3) Get the soldier to medical help as soon as you can. Keep pouring water on him and fanning him.
- 4. Give him cool salt water to drink (see step 1b) if he is conscious and not sick to his stomach.

REFERENCES

FM 21-11, First Aid for Soldiers, pg 88, para 9-8, Jun 76.

TASK**081-831-1009**

Give First Aid for Wet or Cold Injuries

CONDITIONS

Given a soldier with a wet or cold injury (frostbite, immersion foot, trench foot, snow blindness).

STANDARDS

The injury is correctly identified, and first aid is started immediately by following the performance measures.

PERFORMANCE MEASURES**1. Frostbite.****a. Signs/symptoms.**

- (1) The body part is extremely cold, numb, and tingly.
- (2) The skin on the face, ears, or neck may have white spots.

b. First aid.

- (1) Cover frostbitten part of face with warm hands until pain returns. Shallow or superficial frostbite can be corrected by rapid rewarming.
- (2) Place frostbitten bare hands next to skin under the soldier's armpits.
- (3) If feet are frostbitten, seek sheltered area and place bare feet under clothing and against stomach of another person.

- (4) If deep frostbite of the hands or feet is suspected, remove the frostbitten part from further injury and get medical help by fastest means possible. DO NOT attempt to thaw deep frostbite. Do not walk on frostbitten feet unless absolutely necessary. (If the part has been frostbitten for a short time, the frostbite probably involves only the outer skin; otherwise, assume it to be deep.)

2. Immersion Foot/Trench Foot.

- a. Signs/symptoms - Soles of feet are wrinkled and numb, tingling or walking is extremely painful. The feet are cold, numb, tingling, aching, painful, swollen, and cramped.

NOTE: Immersion foot/trench foot is caused by constant wetness of the feet for a prolonged time.

- b. First Aid.

- (1) Dry feet completely and get to medical help by fastest means possible.

- (2) Avoid walking if possible.

3. Snow Blindness.

- a. Signs/symptoms - Scratchy feeling in eyes.

- b. First Aid.

- (1) Cover eyes with dark cloth.

- (2) Move the injured soldier to medical help at once.

REFERENCES

FM 21-11, First Aid for Soldiers, pages 90-91, para 9-9,

TASK**081-831-1010**

Give First Aid for Snakebite

CTIONS

ven a person who has been bitten by a poisonous snake or a snake
pected of being poisonous. Required equipment: bootlace,
estring, or other material which can be used to slow the flow of
od.

ARDS

ve first aid in accordance with performance measures.

RMANCE MEASURES

NOTE: If possible, kill the snake so that the antivenom
serum can be determined. USE EXTREME CAUTION IN
DOING THIS!

NOTE: Try to keep the victim calm while giving aid.
This will slow the rate of poison absorption into the
bloodstream.

Find the bite and strip clothing away from it. Remove watch
rings, etc., from the victim.

Apply a constricting band (bootlace, shoestring, etc.).

- a. Tie the band 2 to 4 inches closer to the heart than site of
bite.
- b. Band should be tight enough so that you can force one finger
between the band and the arm or leg.

SKILL LEVEL 1

- c. Apply cold water or ice if available to the injured arm.

NOTE: If bite is not on an arm or leg, get the victim to medical help immediately. Apply cold water or ice if available.

- d. If swelling moves up the arm or leg to the constriction, tie a second band approximately 4 inches above the first band. If swelling continues to move up the arm or leg, continue to reapply the constriction ahead of the swelling.

NOTE: Do not place the band around a joint. Bones which stick out will keep the band from constricting the flow of poison. If necessary, place the band slightly above the first joint above the bite.

3. Rinse the bite area with water. (If a coral snake bite, rinse the bite before applying the band.)
4. Check for pulse on wrist or ankle of the injured arm or leg.

NOTE: If you cannot feel a pulse, loosen the constricting band.

5. Immobilize the injured arm or leg. Splint the arm or leg (task 081-831-1006).
6. Keep the bitten area below the level of the heart.

NOTE: Watch the victim to see if he has trouble breathing. If the victim stops breathing, administer mouth resuscitation (task 081-831-1001).

7. Move (evacuate) the victim to medical help as soon as possible after giving first aid.
 - a. Keep victim warm and inactive.
 - b. If possible, take the dead snake with the soldier. The correct antivenom serum can be determined.

REFERENCES

FM 21-11, First Aid for Soldiers, p 87, para 9-6a, Jun 76.

TASK**081-831-1011**

Give First Aid to a Nerve Agent Casualty

CTIONS

en a soldier who may have been exposed to a nerve agent. Equip-
t required: Two nerve agent antidote injectors (combo pen), M13
ontamination kit and an M258 decontamination kit.

ARDS

ognize nerve agent symptoms, give nerve agent antidote and decon-
tinate the soldier, his clothing, and his equipment in accordance
the sequence of performance measures.

PERFORMANCE MEASURES

Recognize nerve agent symptoms. These symptoms must appear in
an individual who was well before and gets worse within a very
few minutes. Symptoms of nerve agent follow:

- a. Difficulty in breathing with tightness in chest.
- b. Pinpointing of eye pupils.
- c. Excessive running nose.
- d. Excessive saliva and drooling.
- e. Jerking and twitching muscles, staggering.
- f. Headache, dizziness.
- l. Nausea, cramps.

SKILL LEVEL 1

2. Give nerve agent antidote.
 - a. Remove two combo pens from soldier's mask carrier.
 - b. Remove safety cap from one combo pen; place against injured soldier's outer thigh, press hard 10 seconds (fig 1).

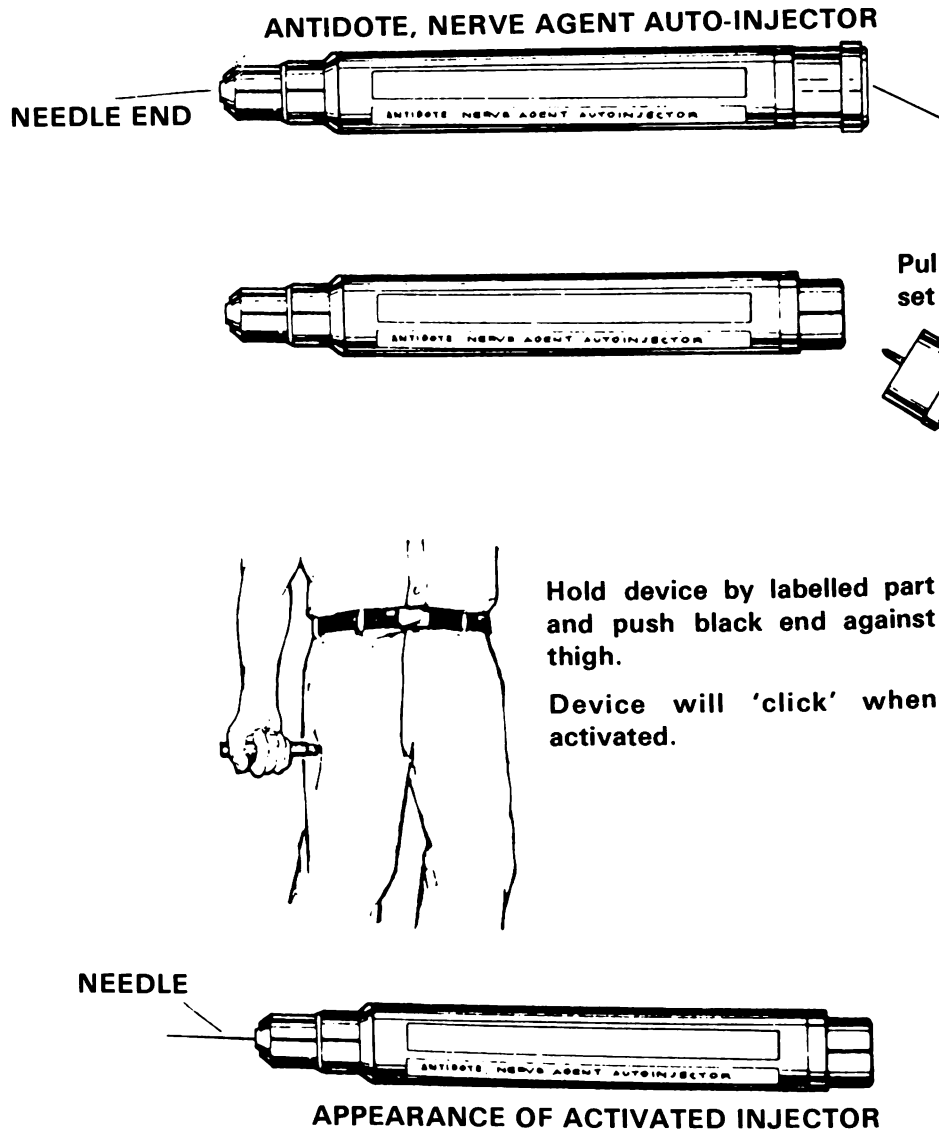


Figure 1. Antidote, nerve agent auto-injector

SKILL LEVEL 1

- c. Remove the safety cap from the second combo pen; place needle end against injured soldier's outer thigh, a couple of inches from the first injection, press hard and hold for 10 seconds.
- d. Massage the injection sites for 10 to 15 seconds.
- e. Stick the injector needles through injured soldier's shirt collar or pocket and bend the needle to secure the pen to clothing.
- . If injured soldier stops breathing, give artificial respiration (task 081-831-1014 or 081-831-1015).
- . Decontaminate the injured soldier, his clothing, and his equipment (tasks 031-503-1007 and 031-503-1008 for performance measures).
- . After giving injection, seek medical help for the injured soldier. Do NOT give more than two combo pens.

RENCES

lone

TASK

081-831-1012

Give First Aid for Blister Agent Casualties

CONDITIONS

Given a soldier injured by blister agent. Required equipment: M258 decontaminating kit or an M13 decontaminating kit, dressing.

STANDARDS

Give first aid to a soldier injured by a blister agent as follows: the sequence of performance measures.

PERFORMANCE MEASURES

1. Recognize presence of blister agent.
 - a. Mustard
 - (1) An oily liquid
 - (2) Colorless to dark brown
 - (3) Causes little or no pain at the time of contact
 - b. Pure lewisite
 - (1) A colorless liquid
 - (2) Causes instant pain on contact
 - c. If blister agent is on the skin a long time:
 - (1) A larger area of skin is affected.

(2) The skin becomes inflamed (red).

(3) Blisters begin to appear.

Take individual protection.

- a. Put on protective mask and secure protective hood over head and shoulders.
- b. Put on protective clothing and wear protective gloves.

Flush eyes if it appears agent is in them.

- a. Remove injured soldier's canteen and unscrew the cap.
- b. Remove injured soldier's helmet.
- c. Tell the injured soldier to take a deep breath and hold it while you raise his mask.
- d. Tilt his head back and to the right, and flush the right eye with water from the canteen. Pour the water slowly into the eye so the water does not run onto face or clothing.
- e. Tilt his head back and to the left to flush the left eye.

NOTE: If the casualty cannot keep his eye open, have him pull his eyelid away from his eye. Insure his fingers are not contaminated. Use approximately one-third canteen of water on each eye.

- f. Have injured soldier reseal and clear his mask before starting to breathe again.

Decontaminate the exposed skin of the injured soldier, his clothing, and his equipment. (See Tasks 031-503-1007 and 031-503-1008 for performance measures.)

If blisters form, cover them with a loose sterile dressing from the injured soldier's first aid packet and secure the dressing with the attached bandages. Do not break blisters.

Seek medical attention if large blisters develop.

REFERENCES

FM 21-11, First Aid for Soldiers, Jun 76, para 11-9, p 134.

FM 21-41, Individual Defense: Nuclear, Biological, Chemical, pp 14 and 15.

TASK

081-831-1013

Give First Aid to a Blood Agent Casualty

ONS

in an area where blood agent is present, given a soldier injured by blood agent. You are wearing your protective mask and clothing. Required equipment: amyl nitrite ampules.

RDS

antidote (amyl nitrite ampules) as described in performance measures.

PERFORMANCE MEASURES

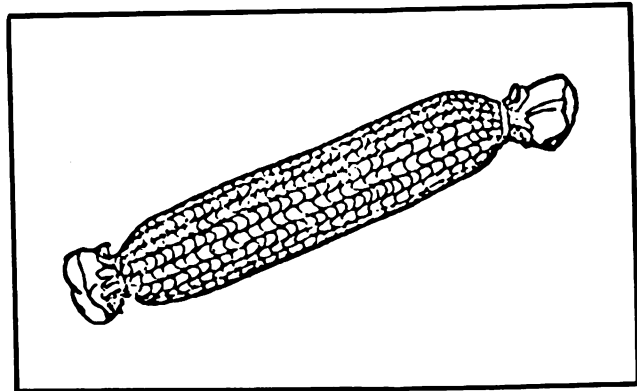
Put mask on the soldier so that it is sealed.

Check soldier for symptoms of blood agent poisoning. Symptoms appear quickly after exposure to blood agents and include:

- . Dizziness.
- . Headache.
- . Irritated eyes and nose.
- . Pink skin.
- . Red or purple color under the fingernails.

Give antidote.

Take the soldier's box of amyl nitrite ampules out of his mask carrier.



AMYL NITRITE AMPULE

- b. Open the seal of the soldier's mask at the temple strap.
- c. Crush two ampules and quickly put them in the mask eyelens area.

NOTE: Do steps b and c at 4- to 5-minute intervals until soldier begins breathing normally or until a total of eight ampules are given.

CAUTION: If soldier is not breathing or breathing is weak, give artificial respiration. When giving the antidote, use the back-pressure arm method (Task 081-831-1015). If you are still in the presence of blood agent, give mask-to-mouth respiration (Task 081-831-1014).

4. Get soldier to medical help.

REFERENCES

FM 21-11, First Aid for Soldiers, Jun 76, para 11-11, p 135.

FM 21-41, Individual Defense: Nuclear, Biological, Chemical, pages 16 and 35.

TASK

081-831-1014

Apply Mask-To-Mouth Resuscitation to a Chemical-Agent Casualty

NS

a soldier who is not breathing and unconscious but has a pulse (beat). The soldier has been exposed to a chemical agent and is in a contaminated area. Both you and the injured soldier are wearing protective masks and you have an M1 Resuscitation Tube.

OS

Perform the steps in the performance measures, performing mask-to-mouth resuscitation without error.

PERFORMANCE MEASURES

1. Prepare your mask (fig 1).

Turn the valve handle at the voicemitter to the left position.

Place and hold the breathing tube bite-piece between your teeth.

NOTE: The bite-piece will spring back to the neutral position if you release your bite.

Lift up the voicemitter cover and insert the air outlet valve of the M1 resuscitation tube into the air outlet well under the voicemitter cover.

NOTE: To get a tight, leakproof seal, first insert the unflanged edge of the air outlet valve with an upward push, and then press the flanged edge inward, toward you.

- d. Check for leakproof seal. Fold back and pinch the lower (mouth piece) of the M1 resuscitation tube. Now blow your breathing tube bite-piece.

NOTE: If you have a leakproof seal, the M1 resuscitation tube will expand. If it does not, remove the air outlet valve from your mask and start all over. You must have a leakproof seal or you will blow contaminated air into the soldier's lungs.

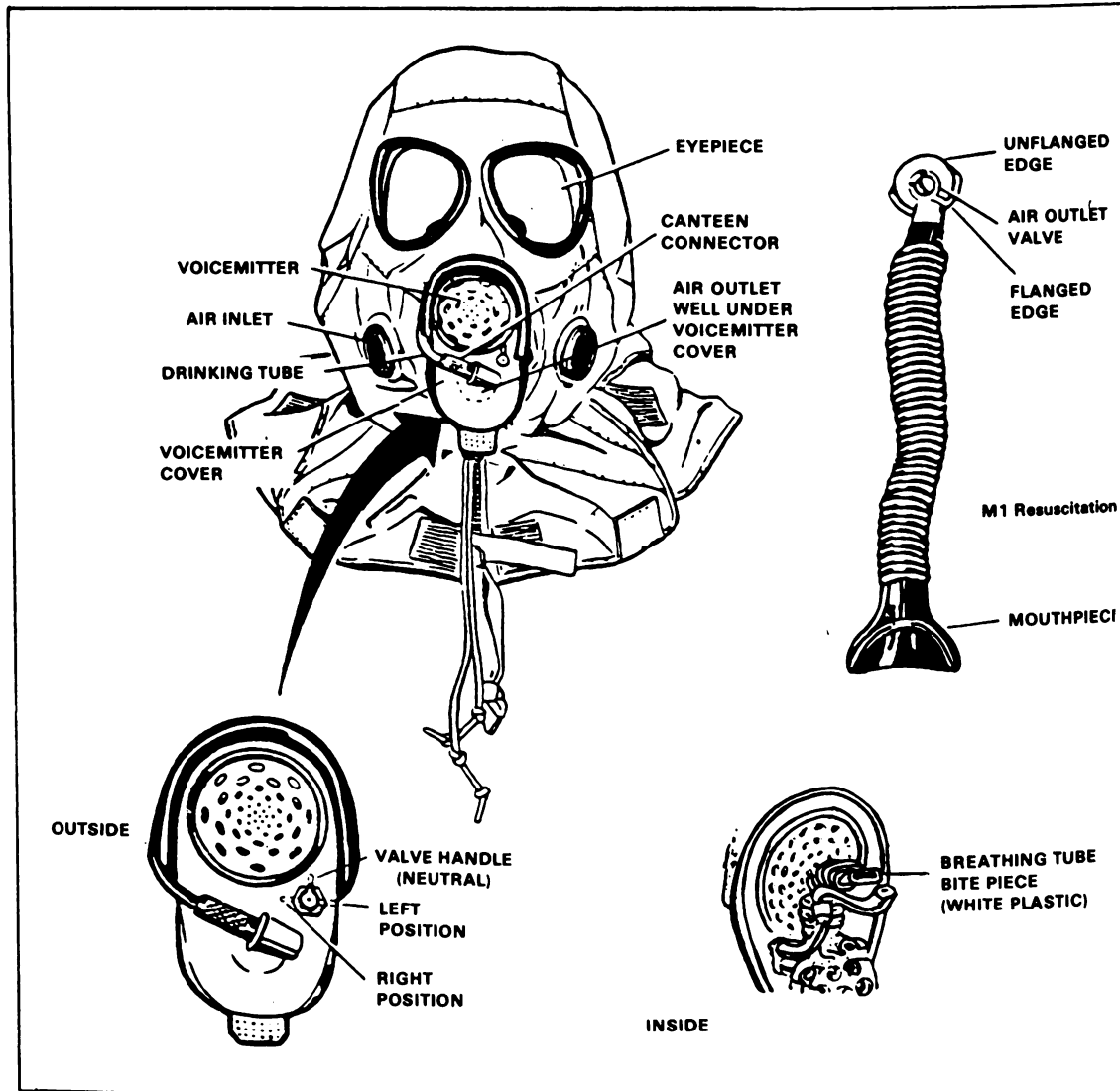


Figure 1. M17A1 field protective mask and M1 resuscitation tube

Place soldier on his back raising his shoulders with a poncho, blanket, or something similar (fig 2).

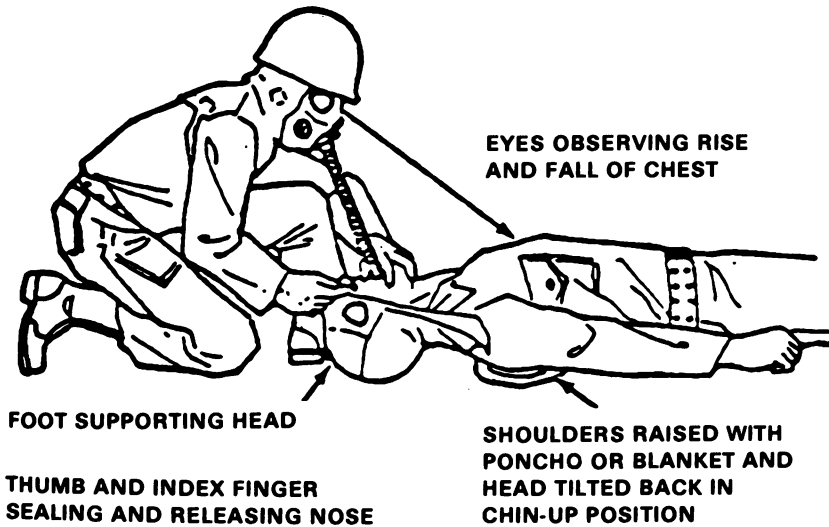


Figure 2.

Kneel at soldier's head on a blanket or other material so you will not contact the contaminated surface (fig 2).

Take off soldier's mask and place it on his chest.

Take any false teeth, dirt, or other material out of the soldier's mouth.

Tilt the soldier's head backward in a chin-up position.

Insert resuscitation tube.

- a. Insert mouthpiece with indented portion under the soldier's upper lip between lips and teeth.

NOTE: Make sure that edges of mouthpiece are completely covered by his lips.

- b. Seal the mouthpiece in place by placing your thumb and index finger over the soldier's lips (fig 3). Hook the other fingers under his chin to keep his jaw up.

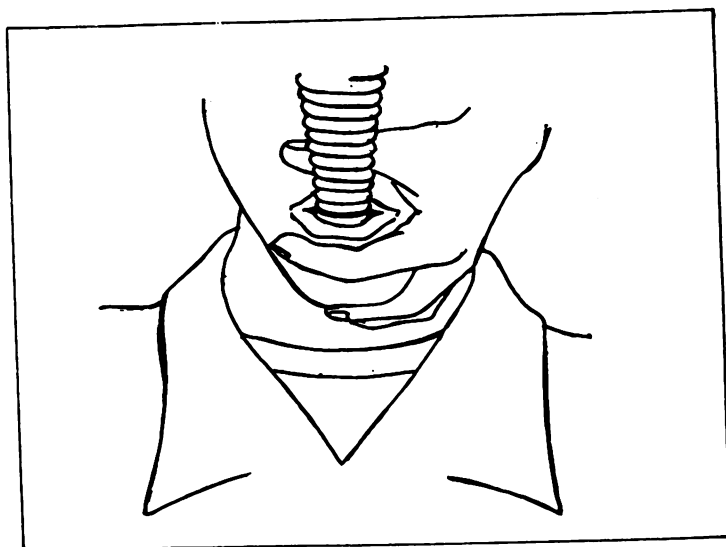


Figure 3.

8. Pinch the soldier's nose closed with your free hand.
9. Blow four quick, forceful breaths into the soldier's mouth until his chest rises.

NOTE: If chest does not rise, hold his chin up higher and blow harder. Make sure the edges of the mouthpiece are completely covered by the soldier's lips.

10. Check for soldier's pulse (task 081-831-1002, fig 2).
11. If there is a pulse, continue breathing into the resuscitator once every 5 seconds. After each breath, release the resuscitator and close it again as soon as the soldier breathes out.

NOTE: If soldier's breath is noisy, hold his chin up higher or clear the airway again.

When soldier begins to breathe on his own, adjust your breathing assist by blowing into the resuscitation tube when he is breathing in, not when he is breathing out.

When soldier begins to breathe regularly, stop blowing but leave tube in place. Continue to close his nose when he inhales and open it when he exhales.

NOTE: Begin resuscitation if the soldier does not continue to breathe regularly.

NOTE: Continue resuscitation as long as there is a pulse, until he begins to breathe on his own, until you are relieved by medically trained personnel, or until you are too exhausted to continue.

When soldier can breathe without help, take the tube from his mouth and quickly put on his mask. If he is conscious, have him wear his mask and be sure it fits properly.

Watch the soldier to be sure he does not stop breathing again as the result of chemical agent that may have built up in his mask.

Adjust your mask.

Release the breathing tube bite-piece, allowing it to spring back to its neutral position.

Disconnect the tube from your mask. Pull the tube out and up, and replace the voicemitter cover.

Wipe the tube mouthpiece clean and stow it in the carrier.

ES

11, First Aid for Soldiers, pp 130 thru 134, para 11-8d, Jun

TASK

081-831-1015

Give Back-Pressure Armlift Artificial Resuscitation To a Chemical Agent Casualty

CONDITIONS

Given an unconscious soldier in a contaminated area who is not breathing but who cannot be given mask-to-mouth resuscitation because of a facial injury, or a soldier who is being given first aid for chemical agent poisoning.)

STANDARDS

Clear the airway and give artificial resuscitation in accordance with performance measures.

PERFORMANCE MEASURES

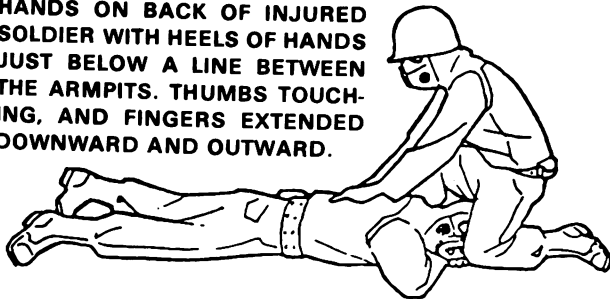
1. Shake the soldier's shoulder and shout, "Are you okay?" If the soldier answers, resuscitation is not needed.
2. If soldier does not answer, call for help in order to get assistance.
3. Kneel at injured soldier's head. If in a contaminated area, place soldier on a poncho or other material to avoid ground contamination.
4. Check to determine if he is breathing by watching for chest movement and listening for breath of his chest.
5. If he is not breathing, put soldier on his stomach with his head to one side, neck extended, and hands under his head as back support.
6. Clear Upper Airway.
 - a. Clear airway by removing any false teeth, dirt, vomit, or other material in the soldier's mouth. Use fingers to remove material. Use a noncontaminated cloth to clean the airway.

- b. If casualty is masked, lift the mask below the chin, clear the airway, remove debris from the mask, and reseat the mask.

Start Respiration.

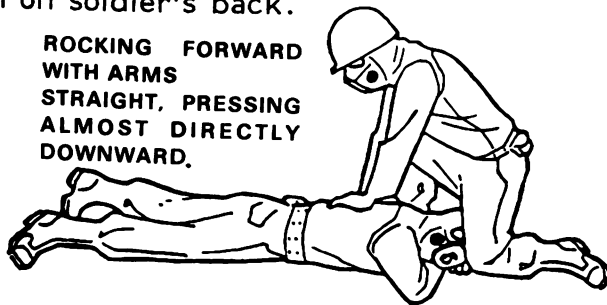
- a. Kneel at soldier's head. Put your hands on his back, fingers extended, just below his shoulder blades.

HANDS ON BACK OF INJURED SOLDIER WITH HEELS OF HANDS JUST BELOW A LINE BETWEEN THE ARMPITS. THUMBS TOUCHING, AND FINGERS EXTENDED DOWNWARD AND OUTWARD.



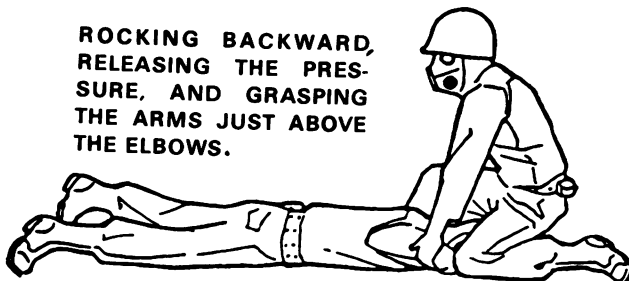
- b. Rock forward, keeping your arms straight, and push straight down on soldier's back.

ROCKING FORWARD WITH ARMS STRAIGHT, PRESSING ALMOST DIRECTLY DOWNWARD.

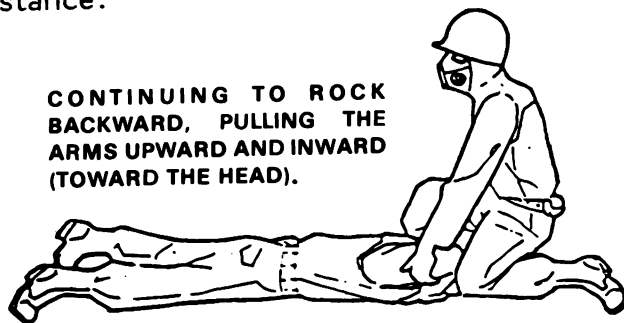


- c. Rock back, grab his arms just above the elbows.

ROCKING BACKWARD, RELEASING THE PRESSURE, AND GRASPING THE ARMS JUST ABOVE THE ELBOWS.



- d. Pull the soldier's arms towards his head until y resistance.



- e. Repeat steps b, c, and d at the rate of one comp every 5 to 6 seconds.
8. Stop respiration.
- a. Stop respiration when the soldier begins to breathe on his own. Watch him to insure that he does not stop breathing.
 - b. If soldier fails to start breathing, continue resuscitation until he breathes on his own, until relieved by medical personnel, or until you are too exhausted to continue.

REFERENCES

None.

TASK

081-851-1001

Disinfect Water for Drinking (Canteen)

CTIONS

in a field environment when safe water is not available. Required equipment: canteen, cup, iodine tablets, calcium hypochlorite ampule, fuel to boil water.

ARDS

Complete the steps in the performance measures in sequence, without error.

PERFORMANCE MEASURES

Using iodine tablets.

- a. Inspect iodine tablets to make sure they are usable. They should be steel gray in color and NOT stuck together or crumbly.
- b. Fill the canteen with the cleanest water available leaving an air space of 1 inch below the neck of the canteen.
- c. Add one iodine tablet to a 1-quart canteen of clear water.

NOTE: If the water is cloudy, add two iodine tablets.

- d. Place the cap on the canteen loosely; wait 5 minutes; then shake the canteen well, allowing leakage to rinse the threads around the neck of the canteen.
- e. Tighten the cap and wait an additional 20 minutes before using the water for any purpose.

SKILL LEVEL 1

NOTE: If water is very cold (45 degrees below) wait 40 minutes.

2. Using calcium hypochlorite.

- a. Fill canteen with clearest water available leaving a space of 1 inch below the neck of the canteen.
- b. Fill a canteen cup half full of water and add the calcium hypochlorite from one ampule, stirring with a clean stick until the powder is dissolved.
- c. Fill the cap of a plastic canteen half full of the solution in the cup and add it to the water in the canteen; then put the cap on the canteen and shake it thoroughly.
- d. Loosen the cap slightly and invert the canteen to allow the treated water to leak onto the threads around the neck of the canteen.
- e. Tighten the cap on the canteen and wait at least 40 minutes before using the water for any purpose.

NOTE: If water is very cold (45 degrees below) wait 1 hour.

3. Using boiling water.

- a. Heat water using any available fuel until water reaches a rolling boil for at least 15 seconds.
- b. Permit water to cool before drinking it.

REFERENCES

FM 21-10, Field Hygiene and Sanitation, Jul 70, para 54, P

TASK**121-004-1417**

Receipt/Control Classified Material

CTIONS

Events require this task to be performed. Your office receives a classified document from the mailroom; a courier delivers a classified document to your office; your office receives a classified message from a telecommunications center; another office within your organization returns to your office a previously transmitted classified document; or your organization generates a classified document which must be properly controlled.

When a classified document, DA Label 22, 23 or 24, DA Forms 3964, access to AR 340-18-1, AR 380-5, DOD Directive 5200.1-R, and standard office materials and equipment.

ARDS

The classified document will agree completely with the accompanying DA Form 3964 description IAW AR 380-5.

Section E of the DA Form 3964 must be signed and returned to the sender IAW AR 380-5.

Enough copies of DA Form 3964 will be prepared to permit intra-office routing and filing IAW AR 380-5.

The classified document will be safeguarded IAW DOD Directive 5200.1-R.

The DA Form 3964 will be filed in an active receipt file IAW AR 340-18-1.

PERFORMANCE MEASURES

1. When you receive a package from the mailroom package/document from a courier or other source, be sure to record the control number on the package/document and the receipt number. Before signing for the package, be sure the package is addressed to your headquarters and there are no signs of tampering.
2. Open the package and examine the contents. If the document is marked TOP SECRET, apply a DA Label 24 cover sheet and contact your supervisor. Your supervisor will contact the TOP SECRET Officer (TSCO). If the document is CONFIDENTIAL, apply a DA Label 22 cover sheet and forward the document to the appropriate action office.
3. If the document is UNCLASSIFIED, send it to the appropriate action office. (If the document is marked "FOR OFFICIAL USE ONLY," apply a DA Label 87 cover sheet before forwarding.)
4. If the document is SECRET, you must apply additional security measures. First, determine whether or not the accompanying DA Form 3964 describes the document. (You might receive a message from the message center without a DA Form 3964. If the DA Form 3964 does not agree with the document, do not forward it. Instead, return the package to the sender (or to the message center). If the DA Form 3964 accurately describes the document, here is what you do. Check the "Receipt of Document Acknowledged" block, sign the receipt in section E, and forward the form to the sender.

**PERMANENT RECEIPT YOU ARE SENDING
TO ANOTHER COMMAND (SAMPLE)**

PERMANENT RECEIPT FROM ONE COMMAND TO YOUR
COMMAND WHICH HAS BEEN SIGNED

OF
COMMAND

FULL RETURN ADDRESS
OF SENDING COMMAND

DATE DA 3964
PREPARED

★ U. S. GOVERNMENT PRINTING OFFICE: 1979-490-874

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD

For use of this form, see AR 396-8; the proponent agency is the Office, Assistant Chief of Staff for Intelligence.

DATE: 15 June 1981

SECTION A - GENERAL

TO: Commander 12th Infantry Division ATTN: AAJAG-A Fort Jones, GA 30312			FROM: Commander Third United States Army ATTN: AJAAG-A Fort McPherson, GA 30330		
DATE RECEIVED	ACTION OFFICE(S)	SUSPENSE DATE(S)		REGISTER OR CONTROL NO.	
CONTROL, LOG OR FILE NO.	CLASSIFI- CATION	NUMBER OF COPIES	DESCRIPTION (Type, File Ref., Unclassified Subject or Short Title and Number of Indorsements Inc'd)		DATE OF DOCUMENT
3AS10001	S	1	Letter, AJAAG-A, Subject: Worldwide Locator System (U) Copy 1 of 3 copies, S.		15Jun81
					THIRD US ARMY

SECTION D - REPRODUCTION AUTHORITY

NUMBER OF COPIES TO BE REPRODUCED	AUTHORIZED BY	DATE
SECTION E - RECEIPT, TRACER ACTION (Check appropriate block)		
<input type="checkbox"/> RECEIPT OF DOCUMENT(S) ACKNOWLEDGED		DOCUMENT(S) HAVE NOT BEEN RECEIVED
<input type="checkbox"/> TRACER ACTION - SIGNED: RECEIPT FOR MATERIAL DESCRIBED ABOVE HAS NOT BEEN RECEIVED.		
DATE	PRINTED NAME, GRADE, TITLE	SIGNATURE
16 June 1981	DAVID B. CHILSON, 1LT, Custodian	David B. Chilson
COMMENTS		

DA FORM 3964, 1 Nov 72

REPLACES DA FORMS 1-63, 1 SEP 63; 1204-1 JAN 66; 981, 1 MAR 68 AND
840, 1 OCT 68, WHICH ARE OBSOLETE.

SIGNATURE OF PERSON
RECEIPTING FOR DOCUMENT
IN THE 12th DIVISION

ORIGINAL COPY RETURNED TO SENDING COMMAND WITHIN 7 DAYS.
ONE COPY SHOULD BE KEPT FOR YOUR RECORDS WITH YOUR CONTROL
NUMBER SHOWN TO FACILITATE INVENTORY AND CONTROL.

5. To bring the document under control, follow local procedure. It is important to "log in" the receipt of classified documents and "log out" the transfer of such documents. Both DA Form 3964 and DA Form 3964 are used for this purpose. However, because DA Form 3964 is widely recognized, use it as the control document. Complete the DA Form 3964 IAW steps 1 through 11. See DA Form Number 121-004-1418, Transfer Classified Material.
6. In addition, in the "Date Received" block of DA Form 3964, enter the date the document was received. Also enter the address of the office(s) in the "Action Office(s)" block and the registration number in the "Register or Control No." block.
7. Distribute and file the classified document IAW standing procedure (SOP). If no further distribution is required, take the receipt and control measures outlined in the following steps:



**INTERNAL RECEIPT FROM YOUR CLASSIFIED CONTROL SECTION
TO AN OFFICE AND BACK TO THE CLASSIFIED CONTROL SECTION
(SAMPLE)**

INTERNAL RECEIPT FROM YOUR CLASSIFIED CONTROL SECTION
TO AN OFFICE AND BACK TO THE CLASSIFIED CONTROL SECTION

WHAT SECTION/OFFICE HAS
ACTION/INFO ON DOCUMENT

DATE DA 3964
PREPARED

DATE DOCUMENT RECEIVED

REGISTERED MAIL
NUMBER IF APPLICABLE

CONTROL (12th DIV)
CONTROL NUMBER

FURTHER LOCAL
CONTROL YOU MAY ADD
ORIGINATOR'S CONTROL
NUMBER

DESCRIPTION OF
DOCUMENT

FOR IN
OFFICE
ACTION/INFO

RETURNED TO THE
CLASSIFIED CONTROL
SECTION

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD									
SECTION A - GENERAL								DATE	
TO: _____ FROM: _____ ACTION OFFICER: AG DATE RECEIVED: 16 June 1981 REGISTER OR CONTROL NO.: _____								16 June 1981	
CONTROL LOG OR FILE NO.	CLASSIFICATION	NUMBER OF COPIES	DESCRIPTION (Include Title and Number of Indications)	DATE OF DOCUMENT	ORIGINATOR				
12086481	S	1	Letter, AJAAG-A, Subject: World Wide Locator System (U) copy 1 of 3 copies, S.	15Jun81	Third US Army				
3AS1001									
SECTION B - ROUTING									
TO	COPY NO.	DATE	PRINT NAME	SIGNATURE					
AG	1	16Jun81	William R Parsley	<i>William R Parsley</i>					
AG Classified	1	17Jun81	DAVID B. CHILSON	<i>David B Chilson</i>					
SECTION C - DESTRUCTION CERTIFICATE (Check appropriate box)									
MATERIAL DESCRIBED HEREON HAS BEEN									
<input type="checkbox"/> DESTROYED	<input type="checkbox"/> FORM IN HALF AND PLACED IN A CLASSIFIED WASTE CONTAINER (AR 390-1)								
OFFICE SYMBOL	DATE	PRINTED NAME OF OFFICIAL	SIGNATURE						
DESTRUCTION RECORD NO.	DATE	PRINTED NAME OF OFFICIAL	SIGNATURE						
PAGE OR COPY NUMBER	DATE	PRINTED NAME OF OFFICIAL	SIGNATURE						
SECTION D - REPRODUCTION AUTHORITY									
NUMBER OF COPIES TO BE REPRODUCED	AUTHORIZED BY	DATE							
SECTION E - RECEIPT TRACER ACTION (Check appropriate box)									
<input type="checkbox"/> RECEIPT OF DOCUMENT IS ACKNOWLEDGED									
<input type="checkbox"/> TRACER ACTION: SIGNED RECEIPT FOR MATERIAL DESCRIBED ABOVE HAS NOT BEEN RECEIVED									
DATE	PRINTED NAME	GRADE	OFFICE	SIGNATURE					
COMMENTS									

DA FORM 3964, 1 May 72

REPLACES DA FORM 1, 1 SEP 50; 1304, 1 JAN 50; 881, 1 MAR 50 AND 500, 1 OCT 50, WHICH ARE OBSOLETE.

8. Determine whether the SECRET document is to be temporarily or transferred permanently to another office or organization. If the document is being routed temporarily, the receiver sign for it in section B of DA Form 3964. If being transferred permanently, have the receiver sign for it in section E. (If the document is not picked up personally, be transmitted IAW steps 12 through 19, Task 121-004-1418, Transfer Classified Material.
9. If the document is being routed temporarily, enter the office or symbol in the "To" block in section B of DA Form 3964. Enter the copy number(s) from the document in the "Copy No." block. Also enter the name of the person to whom the document is sent in the "Printed Name" block.
10. In the "Signature" block of DA Form 3964, obtain the signature of the person receiving the document temporarily. Keep the DA Form 3964 in your files until the classified document is turned in.

REFERENCES

DOD Directive 5200.1-R, Information Security Program Regulations, Nov 73.

AR 340-18-1, w/C1 thru 12, The Army Functional Files Regulations, General Provisions, Aug 69.

AR 380-5, w/C1 thru 3, Department of the Army Supplemental Regulations, 5200.1-R (DODISPR), 15 Aug 79

ITO 100, Safeguarding of Defense Information.

TASK**121-004-1418**

Transfer Classified Material

CONDITIONS

Given classified material, access to DA Form 3964, AR 380-5, DOD Directive 5200.1-R, and standard office supplies.

STANDARDS

The classified document will agree completely with the accompanying DA Form 3964 description in accordance with AR 380-5.

Enough copies of the DA Form 3964 will be prepared to permit transmittal IAW AR 380-5.

The classified document will be packaged and addressed IAW DOD Directive 5200.1-R.

A receipt from the addressee will be obtained within 15 days of transmittal IAW AR 380-5.

If the addressee fails to receipt for the classified document within 15 days, an appropriate tracer action or investigation will be initiated IAW AR 380-5.

PERFORMANCE MEASURES

Determine whether or not copies of DA Form 3964 have been prepared to accompany the classified document.

If you don't have a DA Form 3964, then prepare at least four copies for receipt and tracer-action purposes.

3. Obtain enough copies of blank DA Forms 3964 and carbon paper to assemble them, and enter the current date in the "Date" block in the upper right.
4. In the "To" block, enter the complete mailing address of the agency to which the classified document is being sent. In the "From" block, enter the complete return address of your organization.
5. If a suspense date is being imposed on the addressee, enter the date in the "Suspense Date(s)" block.
6. All classified documents are subject to various control and protection measures. So you will often find that a control, file number has been placed on the document. Find this number and enter it in the "Control, Log, or File No." block.
7. In the "Classification" block, enter the code letter(s) "TS" or "C," as appropriate, for the overall defense classification of the document.
8. In the "Number of Copies" block, enter the actual number of copies of the classified document you are transmitting.
9. Enter the following information in the "Description" block: document type (DF, message, letter, etc.), file reference number, unclassified subject, and number of indorsements or initials with their classification category markings. Copy number of the document should also be present. All of this information should be obtained from a careful examination of the classified document.
10. Enter the date of origin and the name of the originator of the classified document in the appropriate blocks. This information should be obtained from the document itself.
11. If a DA Form 3964 is already attached to the classified document, then check all items in section A of the DA Form 3964 against the classified document. Call your supervisor's attention to any discrepancies. They must be resolved before the classified document can be transferred.

PERMANENT RECEIPT YOU ARE SENDING
TO ANOTHER COMMAND

ADDRESS OF COMMAND YOU
SENDING DOCUMENT(S) TO

YOUR COMPLETE RETURN ADDRESS

CURRENT DATE

☆ U. S. GOVERNMENT PRINTING OFFICE: 1975-488-274

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD						DATE	
For use of this form, see AR 380-5; the proponent agency is the Office, Assistant Chief of Staff for Intelligence.						18 June 1981	
SECTION A - GENERAL							
TO: Commander HQ USAREUR & 7A ATTN: ODCSOPS-X APO NY 09403				FROM: Commander 12th Infantry Division ATTN: AAJAG-A Fort Jones, GA 30312			
DATE RECEIVED		ACTION OFFICE(S)		SUFFIX USE DATE(S)		REGISTER OR CONTROL NO.	
CONTROL, LOG OR FILE NO.	CLASSIFI- CATION	NUMBER OF COPIES	DESCRIPTION (Type, File Ref., Unclassified Subject or Short Title and Number of Indorsements, Inc.)		DATE OF DOCUMENT	ORIGINATOR	
12086581	S	2	Operation Plan (OPLAN) No 6-3, Subject: Exercise Hill Climber (U) Copies 17 & 18 of 35 cys, S.		18Jun81	12th DDiv	

LOCATION OF DOCUMENT(S)
TRANSFERRED

NUMBER OF COPIES TO BE REPRODUCED		AUTHORIZED BY		DATE	
SECTION E - RECEIPT/TRACER ACTION (Check appropriate block)					
<input type="checkbox"/> RECEIPT OF DOCUMENT(S) ACKNOWLEDGED			<input type="checkbox"/> DOCUMENT(S) HAVE NOT BEEN RECEIVED		
<input type="checkbox"/> TRACER ACTION: SIGNED RECEIPT FOR MATERIAL DESCRIBED ABOVE HAS NOT BEEN RECEIVED.					
DATE	PRINTED NAME, GRADE OR TITLE			SIGNATURE	
COMMENTS					

DA FORM 3964, 1 Nov 72

REPLACES DA FORMS 1-03, 1 SEP 58; 1204, 1 JAN 60; 681, 1 MAR 62 AND
846, 1 OCT 63, WHICH ARE OBSOLETE.

INSURE MINIMUM OF TWO COPIES OF RECEIPT ACCOMPANYING
DOCUMENTS. KEEP ONE COPY IN SUSPENSE AND IF AFTER 10-14
DAYS YOU HAVE NOT RECEIVED YOUR PERMANENT RECEIPT —
INITIATE TRACER ACTION IMMEDIATELY.

FURTHER INSURE DOCUMENTS/RECEIPT ARE PROPERLY WRAPPED AND
ADDRESSED PRIOR TO SENDING VIA REGISTERED MAIL.

12. Based on the size of the document to be mailed, select two envelopes. At least one must have the indicia (postage stamps) printed on it; this will be used as the outer envelope.
13. Type on both envelopes your return address and the mailing address. On the envelope which will be used as the inner envelope (nonindicia), stamp in red or black ink the classification of the document you are mailing. Include any additional warnings, such as RESTRICTED DATA.
14. Place the document and two copies of the DA Form 3964 in the inner envelope and seal it. This includes putting paper tape at each corner and across the back flap. Place this envelope in the outer envelope and seal it. If the document is to be sent by courier or registered mail, apply paper tape to each corner and across the back flap. If the document is to be sent by certified mail, paper tape does not need to be applied.
15. On the outer envelope, mark the appropriate means of transmittal (either Courier or US Postal Service) IAW DOD Directive 5200.107. If transmittal is by courier, obtain a receipt for the package from the authorized courier. If the US Postal Service (USPS) registered or certified mail is used, obtain the appropriate receipt from the mailroom, post office, or Army Post Office (APO).
16. Transmit the classified document package.
17. On your file copies of DA Form 3964, enter the date transmitted and any courier or USPS receipt numbers obtained. File your Forms 3964 in 15-day suspense.
18. If the signed DA Form 3964 is received from the addressee within 15 days, file the signed DA Form 3964. If no signed DA Form 3964 is received within 15 days, pull your file copy of the DA Form 3964, place a check mark in "Tracer-Action" block of the block E, and send the tracer DA Form 3964 to the addressee. File your copy of the tracer DA Form 3964 in 15-day suspense.
19. If the addressee acknowledges receipt of the classified document, then file the signed DA Form 3964. This completes the tracer. If the addressee indicates that the classified document has not been received, notify your supervisor at once. Your supervisor will contact postal authorities for a Registered-Mail tracer. If necessary, your supervisor will initiate an appropriate investigation.

REFERENCES

DOD Directive 5200.1-R, Information Security Program Regulation, Nov 73.

AR 380-5, w/C1 thru 3, Department of the Army Supplement to DOD 5200.1-R (DODISPR), 15 Aug 79

ITO 100, Safeguarding of Defense Information.

TASK

113-600-0004

Troubleshoot Telephone Assembly TA-236D and 554W

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Telephone Set TA-236 or 554W with suspected malfunction.
2. DA Form 2407 with telephone set trouble symptoms listed in 16 or DA Form 4174 properly annotated with trouble report.
3. Tool Kit TE-49.
4. Tool Kit TE-73.
5. Pen.
6. TM 11-468.
7. TM 11-2103.
8. TM 38-750.
9. Assistance of the test desk or switchboard attendant.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the telephone set trouble symptoms have been isolated and the appropriate actions have been made on the DA Form 2407, or DA Form 4174, as directed in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment.

equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407 or trouble reported section of DA Form 4174.
3. Perform an operational test of the telephone set as follows. (Refer to TM 11-468, para 47d(1) and 80, pp 60 and 92.)
 - a. Connect the telephone set to the terminals of a line known to be operational.
 - b. Remove the handset from the cradle and listen to the receiver. (The presence of dial tone indicates normal operation.)
 - c. Dial the number of the test desk, test board, or operator. (Receiving ring-back tone indicates that the telephone is operating properly.)
 - d. Converse with the attendant and determine whether transmission and reception is occurring.
 - e. Tell the attendant the number to call and ask him to ring back.
 - f. Replace the handset on the cradle.
 - g. Listen for the ringing signal. (Ringing of the telephone set is normal.)
4. Inspect the telephone set for defects that can be observed easily. (Refer to TM 11-468, para 47d(2), p 60.)
5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-468, para 48b, pp 63 thru 65.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-468, para 48b, pp 63 thru 65.)

7. Record required entries in columns 20b, e, g, h, and j of DA Form 2407 or the trouble found in section of DA Form 2407 (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2; TM 11-2103, para 38i(3), p 31.)
8. Notify the supervisor that the defect has been located.

TM 11-468, w/C 2 and 3, Substation Maintenance, Dec 54.

TM 11-2103, w/C 1 and 2, Basic Maintenance Practices: Step-B
Dial Central Office Equipment, Jun 50.

TM 38-750, w/C 1 and 2, The Army Maintenance Management
(TAMMS), May 78.

TASK

113-600-4004

Repair Telephone Assembly TA-236D and 554W

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Telephone Assembly TA-236D or 554W.
2. DA Form 2407 with the equipment defects listed in block 20.
3. Serviceable part(s) or components(s) to replace the defective items(s).
4. Operational line to a dial central office.
5. Tool Kit TE-49.
6. Multimeter TS-352B/U (or equivalent multimeter).
7. Clean dry lint-free cloth.
8. Cleaning compound.
9. Pen.
10. TM 11-468.
11. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the telephone set have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the component(s) or part(s) to be replaced or adjusted and those that must be removed to gain access to items removed or adjusted. (Refer to TM 11-468, para 77, pp 88 thru 91.)
4. Reassemble the telephone assembly, substituting serviceable parts and component(s) for unserviceable item(s). (Refer to TM 11-468, para 77, pp 88 thru 91.)
5. Perform final tests of the telephone set. (Refer to TM 11-468, para 78 thru 80, pp 91 and 92.)
6. Record the entries required in blocks 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table 1.)
7. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-468, w/C 2 and 3, Substation Maintenance, Dec 54.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-4005**

Repair "A" Type Relays

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective "A" type relay.
2. DA Form 2407 with the relay defects listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tools.
 - a. XY dial central office tools are required if the relay is installed in a dial central office.
 - b. The following items are required if the relay is installed in a manual telephone central office.
 - (1) Tool Kit TE-49.
 - (2) Tool Kit TE-73.
 - (3) Manual Telephone Central Office AN/TTC-7, special tools.
 - (4) Manual Telephone Central Office AN/TTC-7, maintenance materials.
5. Test Set, Relay TS-1775/U or Test Set I-181 (or equivalent.)
6. Multimeter AN/URM-105 (or equivalent multimeter.)
7. Blocking material (nonconductive).

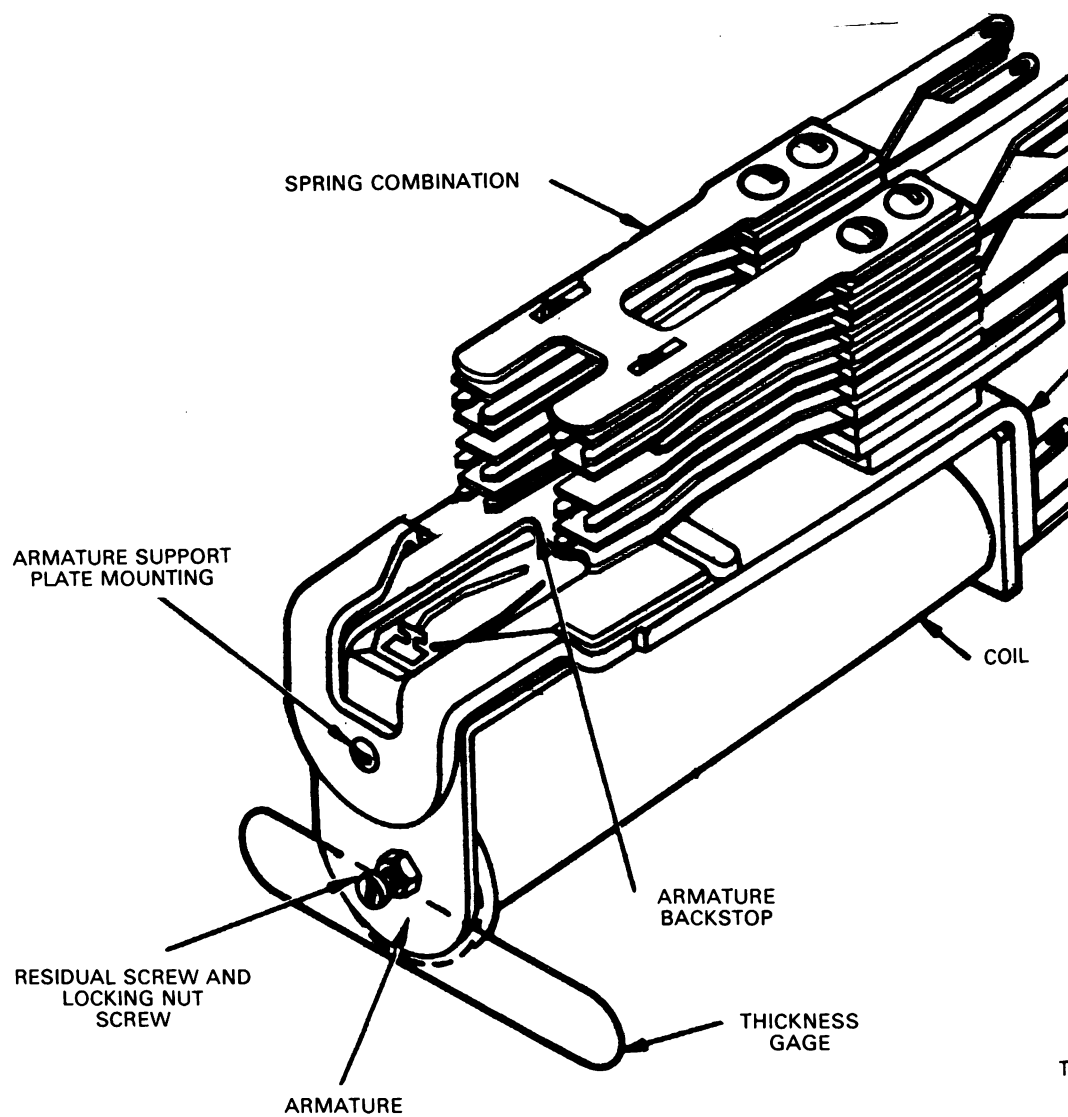


Figure 1 "A" Type Relay

8. Toothpicks.
9. Sheet of bond paper.
10. Length of cord.
11. Labeling material.
12. Pen.
13. TM 11-2101.
14. TM 11-2120.
15. TM 11-2146.
16. TM 11-6625-202-14.
17. TM 38-750.
18. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the relay have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 and 235; or TM 11-2146, para 77a and 78, pp 58 and 59.)
2. Review the defects listed in column 20 of the DA Form 2407.
3. Remove the circuit in which the relay is installed from service.
4. Clean the relay components. (Refer to TM 11-2146, para 99, pp 74 thru 76.)

NOTE: If no parts need to be replaced, go to step 11.

5. Remove plate-mounted relay(s) as stated in 5a, 5b or 5c, as applicable.
 - a. "A" type relay installed in an XY dial central office. (Refer to TM 11-2101, para 193e, pp 213 thru 214; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
 - b. "A" type relay mounted in a Manual Telephone Switch SB-249/TTC. (Refer to TM 11-2146, para 108a, 108b(2), p 89; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
 - c. "A" type relay mounted in a line or trunk case. (Refer to TM 11-2146, para 110a and 110c, p 91; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)

NOTE: If neither the relay pusher nor the relay stop requires replacement, go to step 9.

6. Remove the pusher from the relay. (Refer to TM 11-2101, para 187a(2), 187a(5), p 174; pp 175 and 176, figs 93 and 94; TM 11-2146, para 93b thru 93e, p 70; p 71, figs 36 and 37.)

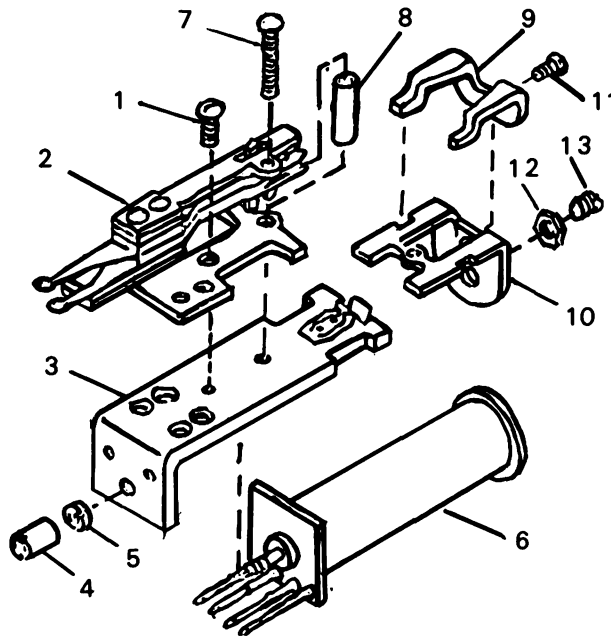
NOTE: If the pusher is the only part of the relay to be replaced, go to step 9.

7. Remove the stop from the relay. (Refer to TM 11-2101, para 187b(3) thru 187b(10), p 175; pp 176 and 177, figs 95 and 96; TM 11-2146, para 94c thru 94j, pp 70 thru 72, figs 39 and 40.)

NOTE: If no further relay parts are to be replaced, go to step 9.

8. Disassemble the relay by removing the following parts in the indicated sequence to the extent required to make the : (Refer to TM 11-2101, para 188a, pp 176 and 177; TM 11-2146, para 95a, pp 71 and 72, fig 2 below.)
 - a. Clamping plate screw and spacer.
 - b. Spring combination mounting plate.
 - c. Screw and spring combination.

- d. Residual screw and locknut.
- e. Armature support mounting screw.
- f. Armature support and armature.
- g. Coil mounting nut and washer.
- h. Coil.



1. Spring combination mounting plate screw (4-40 by 3/16 inch roundhead machine screw).
2. Spring combination.
3. Frame.
4. Coil mounting nut (ring nut, slotted, 5/16 inch long by 1/4 inch outside diameter).
5. Coil mounting washer (lock 5/32 inch inside diameter).
6. Coil.
7. Clamping plate screw (4-40 by 7/8 inch roundhead machine screw).
8. Spacer.
9. Armature support.
10. Armature.
11. Armature support mounting screw (2-56 by 3/16 inch roundhead machine screw).
12. Residual screw locknut (10-32 hexagonal).
13. Residual screw (10-32 by 1/4 inch special headless machine screw).

Figure 2 "A" Type Relay, Exploded View

9. Reassemble the relay by substituting serviceable parts for viceable ones and assembling the parts on the frame in following sequence. (Refer to TM 11-2101, para 188b(1) thru (9), p 177; para 187b(11) thru 187b(16), pp 175 and 176; fig 96b; para 187a(6) thru 187a(9), p 174; p 176, fig 11-2146, para 95b, p 72; para 94k thru 94p, p 71; p 72, para 93e thru 93h, p 70; p 71, fig 38; fig 2 below.)
 - a. Coil.
 - b. Washer and coil mounting nut.
 - c. Armature and armature support.
 - d. Armature support mounting screw.
 - e. Residual screw locknut and residual screw.
 - f. Spring combination and spring.
 - g. Combination mounting plate screw.
 - h. Spacer and clamping plate screw.
 - i. Stop.
 - j. Pusher.
10. Mount the new or repaired relay on the plate as stated 10b, or 10c, as applicable.
 - a. "A" type relay to be mounted on a circuit plate in a central office. (Refer to TM 11-2101, para 193e 193e(6), p 214; TB SIG 222, para 84 thru 89, pp 68 thru 55 thru 60, pp 2 thru 8.)
 - b. "A" type relay to be mounted in a manual telephone board SB-249/TTC. (Refer to TM 11-2146, para 1 108c, p 89; TB SIG 222, para 84 thru 89, pp 68 thru 55 thru 60, pp 2 thru 8.)
 - c. "A" type relay to be mounted in a line or trunk case to TM 11-2146, para 110f thru 110h, p 91; TB SIG 84 thru 91, pp 68 thru 71; para 55 thru 60, pp 2
11. Measure the characteristics of the relay. (Refer to TM para 180b, pp 162 and 163; TM 11-2146, para 100a, p 76.

12. Adjust the mechanical components of the relay. (Refer to TM 11-2101, para 181, pp 163 thru 165; TM 11-2146, para 101, pp 76 thru 79.)
13. Test the electrical operating characteristics of the relay. (Refer to TM 11-6625-202-14, para 3-4 thru 3-10, pp 3-2 thru 3-5; TM 11-2101, para 189 thru 191, pp 179 thru 212; TM 11-2146, para 103, pp 81 thru 83; Task 113-604-0060, Test "A" Type Relay Using Test Set, Relay TS-1775/U.)
14. Perform steps 4 through 12 as required, until the relay meets the standards of equipment performance. (Refer to step 13.)
15. Restore the circuit to service.
16. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
17. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2101, Basic Maintenance Practices: XY Dial Central Office Equipment, Aug 58.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 11-2146, Central Office Telephone, Manual AN/TCC-7 and AN/TCC-7A; Telephone Central Office Group, Manual AN/GTA-14(V) and Telephone Circuit Trunk Relay, TA-276A/TTC, Jan 58.

TM 11-6625-202-14, Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Test Set, Relay TS-1775/U, Oct 75.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 414, Maintenance of the Common-Battery Telephone System.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK**113-604-4006****Repair "C" Type Relays****CONDITIONS**

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective "C" type relay.
2. DA Form 2407 with the relay defects listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tools.
 - a. XY dial central office tools are required if the relay is installed in a dial central office.
 - b. The following items are required if the relay is installed in a manual telephone central office.
 - (1) Tool Kit TE-49.
 - (2) Tool Kit TE-73.
 - (3) Manual Telephone Central Office AN/TTC-7, specifications.
 - (4) Manual Telephone Central Office AN/TTC-7, maintenance materials.
5. Test Set, Relay TS-1775/U or Test Set I-181 (or equivalent).
6. Multimeter AN/URM-105 (or equivalent multimeter).

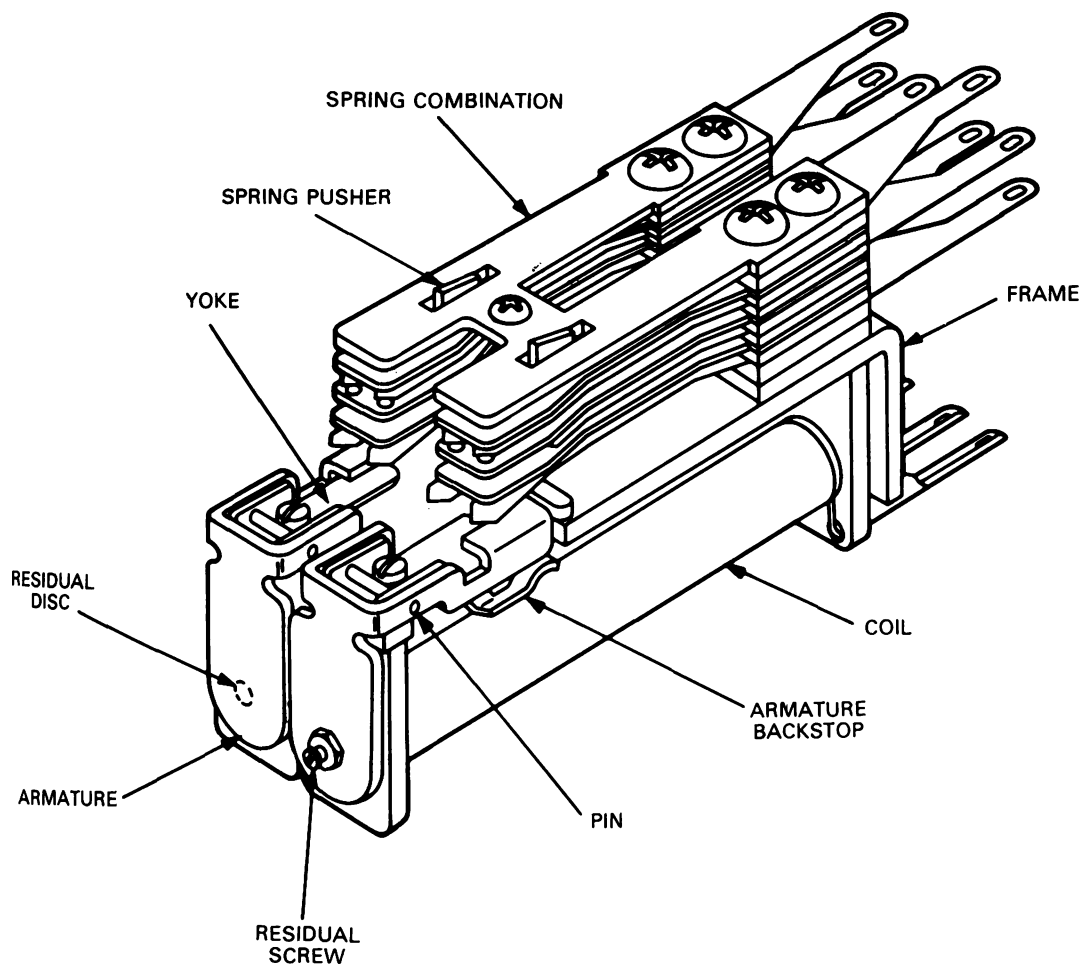


Figure 1. "C" Type Relay

7. Blocking material (nonconductive).
8. Toothpicks.
9. Sheet of bond paper.
10. Length of cord.
11. Labeling material.
12. Pen.
13. TM 11-2101.
14. TM 11-2120.

SKILL LEVEL 1

15. TM 11-2146.
16. TM 11-6625-202-14.
17. TM 38-750.
18. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the relay have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed in the CONDITIONS.
2. Review the defects listed in column 20 of the DA Form 2407.
3. Remove the circuit in which the relay is installed from service.
4. Clean the relay components. (Refer to TM 11-2146, para 974 thru 76.)

NOTE: If no parts need to be replaced, go to step 11.

5. Remove plate-mounted relay(s) as stated in 5a, 5b or 5c, as applicable.
 - a. "C" type relay installed in an XY dial central office. (Refer to TM 11-2101, para 193e, pp 213 and 214; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
 - b. "C" type relay mounted in a Manual Telephone Switch SB-249/TTC. (Refer to TM 11-2146, para 108a, 108b(1) thru 108b(2), p 89; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)

- c. "C" type relay mounted in a line or trunk case. (Refer to TM 11-2146, para 110a and 110c, p 91; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)

NOTE: If neither the relay pusher(s) nor the relay stop(s) require(s) replacement, go to step 9.

6. Remove the pusher(s) from the relay. (Refer to TM 11-2101, para 187a(2) thru 187a(5), p 174; p 175, fig 93; p 176, fig 94a; TM 11-2146, para 93b thru 93e, p 70; p 71, figs 36 and 37.)

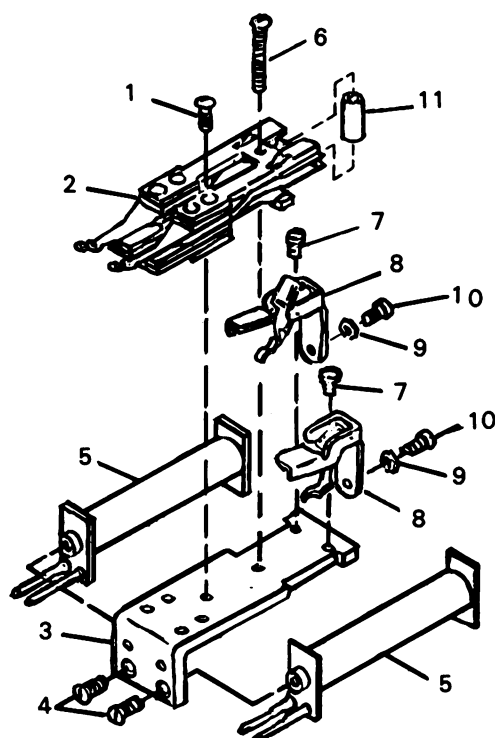
NOTE: If the pusher(s) is/are the only part(s) of the relay to be replaced, go to step 9.

7. Remove the stop(s) from the relay. (Refer to TM 11-2101, para 187b(3) thru 187b(10), p 175; p 176, fig 95; p 177, fig 96a; TM 11-2146, para 94c thru 94j, pp 70 thru 72, figs 39 and 40.)

NOTE: If no further relay parts are to be replaced, go to step 9.

8. Disassemble the relay by removing the following parts in the indicated sequence to the extent required to make the repair: (Refer to TM 11-2101, para 188c, pp 177 and 178; TM 11-2146, para 96a, p 72; fig 2 below.)

- a. Clamping plate screw and spacer.
- b. Spring combination mounting plate screw and spring combination.
- c. Armature mounting screws.
- d. Armature assemblies.
- e. Residual screws and residual screw locknuts.
- f. Coil mounting screws.
- g. Coils.



1. Spring combination mounting plate screw (2-40 by 3/16 inch roundhead screw).
2. Spring combination.
3. Frame.
4. Coil mounting screw (4-40 by 5/16 inch flathead machine screw).
5. Coil.
6. Clamping plate screw (4-40 by 7/8 inch roundhead machine screw).
7. Armature mounting screw (4-40 by 3/16 inch binding head screw).
8. Armature assembly.
9. Residual screw locknut (3-48 hexagonal).
10. Residual screw (3-48 by 19/64 inch binding head screw).
11. Spacer.

Figure 2. "C" Type Relay, Exploded View

9. Reassemble the relay by substituting serviceable parts for unserviceable ones and assembling the parts on the frame in the following sequence: (Refer to TM 11-2101, para 188d(1) thru 188d(178 and 179; para 187b(11) thru 187b(16), pp 175 and 176; fig 96b; para 187a(6) thru 187a(9), p 174; p 176, fig 11-2146, para 96b, p 72; para 94k thru 94p, p 71; p 93e thru 93h, p 70; p 71, fig 38; fig 2 below.)

- a. Coils.
 - b. Coil mounting screws.
 - c. Armature assemblies with residual screws and residual screw locknuts installed.
 - d. Armature mounting screws.
 - e. Spring combination.
 - f. Spring combination mounting plate screw.
 - g. Spacer and clamping plate screw.
 - h. Stops.
 - i. Pushers.
10. Mount the new or repaired relay on the plate as stated in 10a, 10b, or 10c, as applicable.
- a. "C" type relay to be mounted on a circuit plate in an XY dial central office. (Refer to TM 11-2101, para 193e(4) thru 193e (6), p 214; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
 - b. "C" type relay mounted in a Manual Telephone Switchboard SB-249/TTC. (Refer to TM 11-2146, para 108b and 108c, p 89; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
 - c. "C" type relay to be mounted in a line or trunk case. (Refer to TM 11-2146, para 110f thru 110h, p 91; TB SIG 222, para 84 thru 91, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
11. Measure the characteristics of the relay. (Refer to TM 11-2101, para 180b, pp 162 and 163; TM 11-2146, para 100a, p 76.)
12. Adjust the mechanical components of the relay. (Refer to TM 11-2101, para 183 and 184, pp 170 and 171; TM 11-2146, para 102, pp 79 thru 81.)
13. Test the electrical operating characteristics of the relay. (Refer to TM 11-6625-202-14, para 3-4 thru 3-10, pp 3-2 thru 3-5; TM 11-2101, para 189 thru 191, pp 179 thru 212; TM 11-2146, para 103, pp 81 thru 83; Task 113-604-0060, Test "A" Type Relay Using Test Set, Relay TS-1775/U.)

14. Perform steps 4 thru 12 as required, until the relay meets standards of equipment performance. (Refer to step 13.)
15. Restore the circuit to service.
16. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A)
17. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2101, Basic Maintenance Practices: XY Dial Central Office Equipment, Aug 58.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Test Equipment), Mar 57.

TM 11-2146, Central Office Telephone, Manual AN/TTC-7 and TTC-7A; Telephone Central Office Group, Manual AN/GTA-14(V), Telephone Circuit Trunk Relay, TA-276A/TTC, Jan 58.

TM 11-6625-202-14, Operator's, Organizational, Direct Support General Support Maintenance Manual: Test Set, Relay TS-1775/U, 75.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 414, Maintenance of the Common-Battery Telephone System.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK**113-604-0060**

Test "A" Type Relay Using Test Set Relay TS-1775/U

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. "A" type relay installed in an item of equipment (Switchboard SB-249/TTC, Trunk Relay Telephone Circuit TA-226/TTC, XY dial central office equipment, etc.).
2. DA Form 2404 for recording test results.
3. DA Form 2407 for recording maintenance actions.
4. Test Set, Relay TS-1775/U (or equivalent).
5. Tool Kit TE-123 or dial central office tools.
6. Blocking material (nonconductive).
7. Station battery (or 22½ volt or 45 volt dry cell battery).
8. Pen.
9. TM 11-6625-202-14.
10. TM 38-750.
11. Manufacturer's relay adjustment sheets and/or the maintenance manual for the equipment in which the relay is installed.

Supervision and assistance are available.

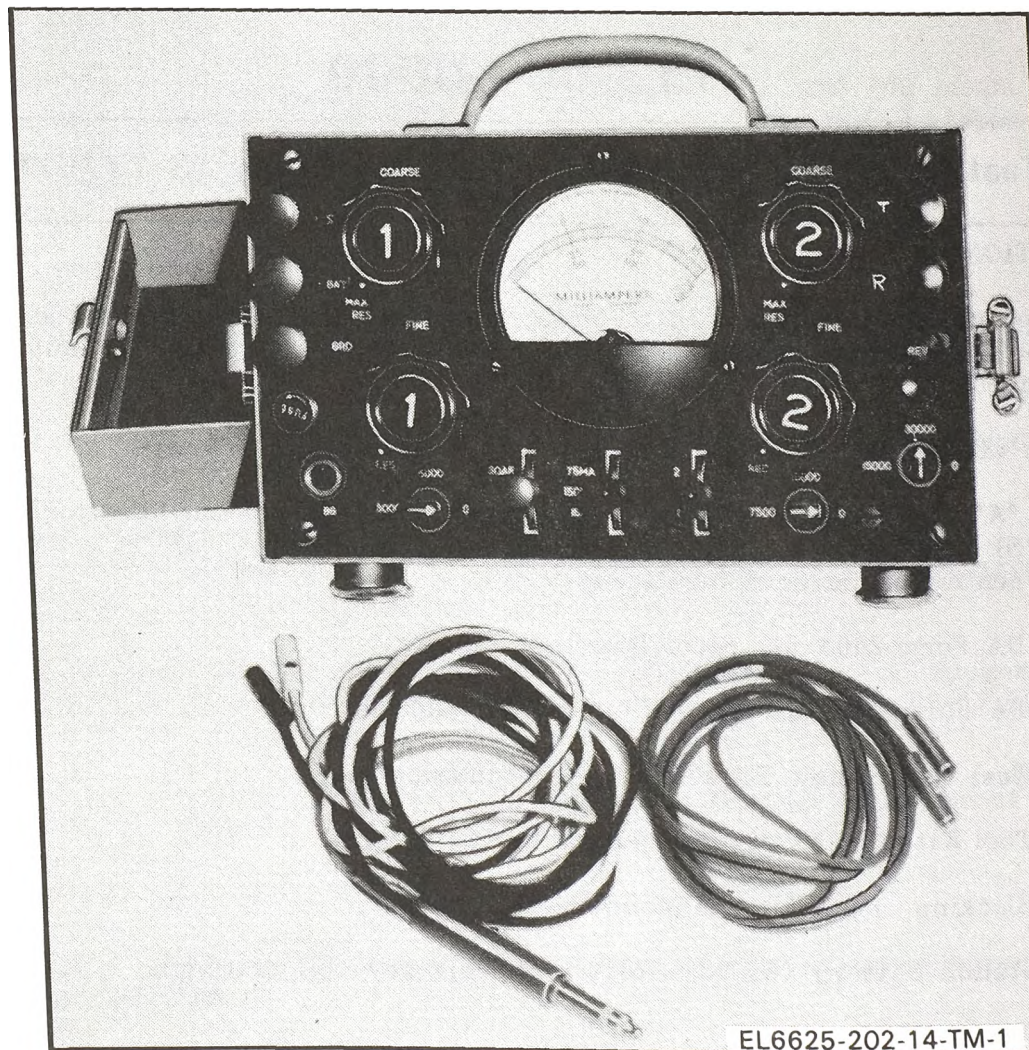


Figure 1. Relay Test Set TS-1775/U

STANDARDS

Task standard has been completed when the operation of the re been tested and evaluated as described in the performance m and the references. These actions will be done in accordance m safety precautions for working with electrical/electronic equipm that the equipment will not be damaged and maintenance person not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment and materials listed under CONDITIONS.

NOTE: While testing the relay, compare the test results with the standards of equipment operation given in the applicable relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed.

2. Set the Test Set 75MA-150MA-15MA Switch at 150MA. (The switch will be moved from the 150MA scale only if the meter indicates that the circuit current will produce less than a full-scale reading for the scale to be used. The 75MA-150MA-15MA Switch will be set at 150MA before current is increased using the twist switches.) (Refer to TM 11-6625-202-14, para 3-2a and 3-2b, p 3-1.)
3. Turn all rheostat control knobs counterclockwise to the MAX RES position. (Both COARSE and both FINE knobs will be set at the MAX RES position.) (Refer to TM 11-6625-202-14, para 3-2c(1), p 3-1.)
4. Set the 3000-6000-0 Switch at 6000. (Refer to TM 11-6625-202-14, para 3-2c(1), p 3-1.)
5. Set the 7500-15000-0 Switch at 15000. (Refer to TM 11-6625-202-14, para 3-2c(1), p 3-1.)
6. Set the 15000-30000-0 Switch at 30000. (Refer to TM 11-6625-202-14, para 3-2c(1), p 3-1.)
7. Insulate any relay contact which requires insulation. (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed; and TM 11-6625-202-14, para 3-4, p 3-2.)
8. Block any relay contacts which must be maintained in either the operated or the unoperated state during the test. (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed; and TM 11-6625-202-14, para 3-4, p 3-2.)
9. Set any equipment switches that require setting. (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed; and TM 11-6625-202-14, para 3-4, p 3-2.)

10. Connect the test set to an appropriate power source and/or to the relay to be tested in one of the following modes: (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed; and TM 11-6625-202-14, para 3-5, pp 3-3 and 3-4; figs 2 thru 3-5.)
 - a. B/G (battery - ground).
 - b. BAT (battery).
 - c. GRD (ground).
 - d. M (metallic).
 - e. NGB (nongrounded battery).
11. Operate the test set in the following modes as required: (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed; and TM 11-6625-202-14, para 3-6 thru 3-10, pp 3-4 and 3-5.)
 - a. Operate and nonoperate relay test using the test set M circuit (no soak requirement specified). (Refer to TM 11-6625-202-14, para 3-6a, 3-6b, 3-7a, and 3-8a, pp 3-4 and 3-5.)
 - b. Operate and nonoperate relay test using the test set BAT circuit (no soak requirement specified). (Refer to TM 11-6625-202-14, para 3-6a, 3-6b, 3-7b, and 3-8b, pp 3-4 and 3-5.)
 - c. Operate and nonoperate relay test using the test set M circuit and soak circuit (soak current value not specified). (Refer to TM 11-6625-202-14, para 3-6b, 3-6e, 3-7a, and 3-8a, pp 3-4 and 3-5.)

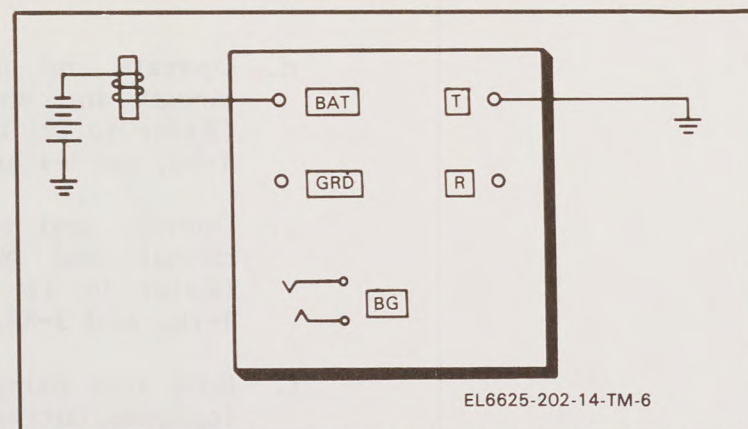
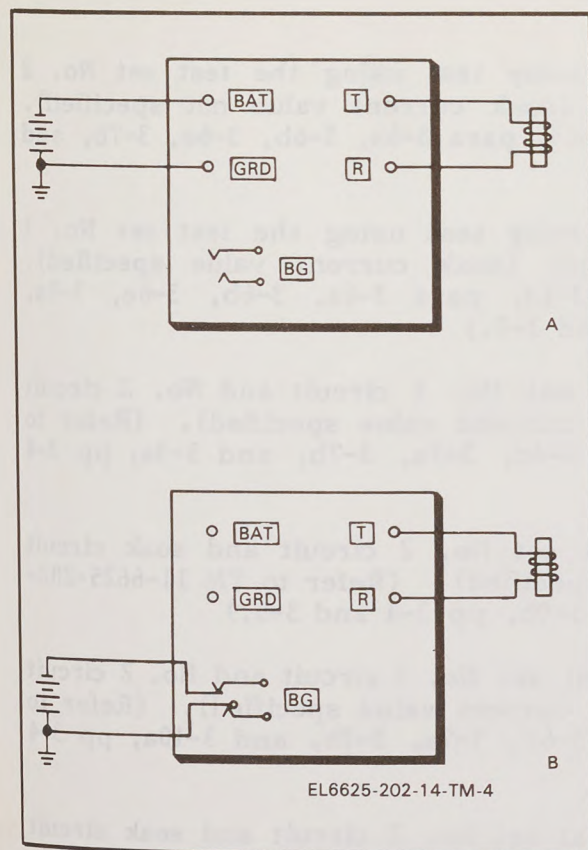


Figure 4. GRD (Ground) Test Connections

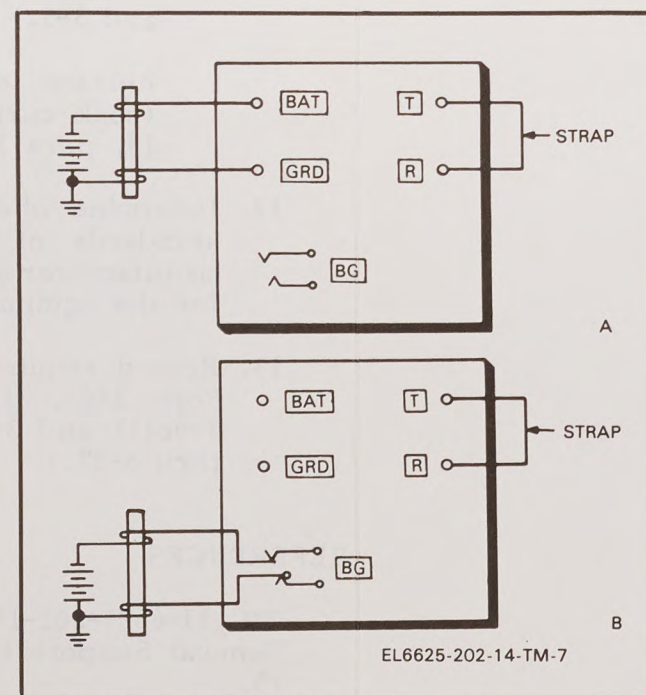


Figure 5. M (Metallic) Test Connections

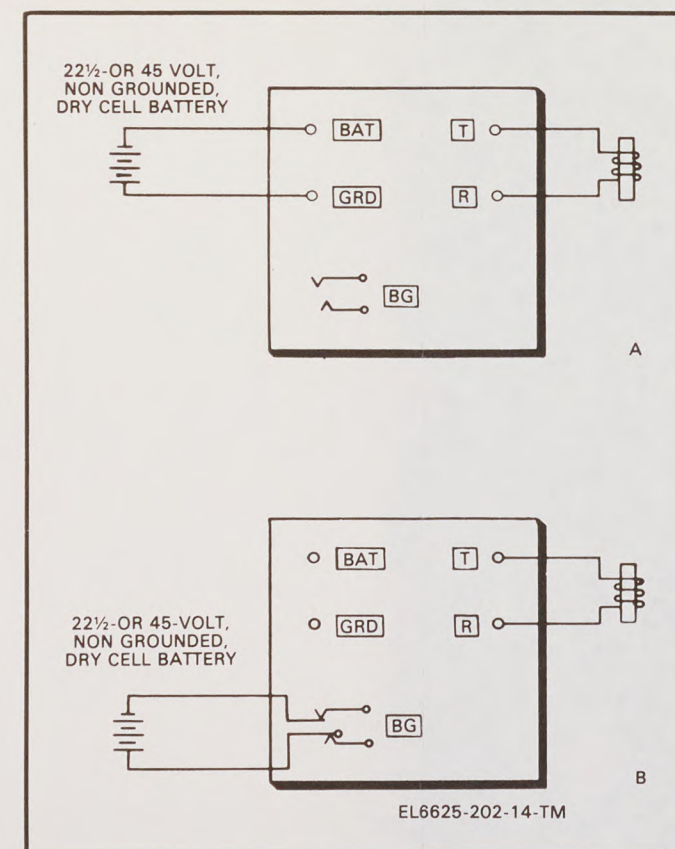


Figure 6. NGB (Nongrounded Battery) Test Connections

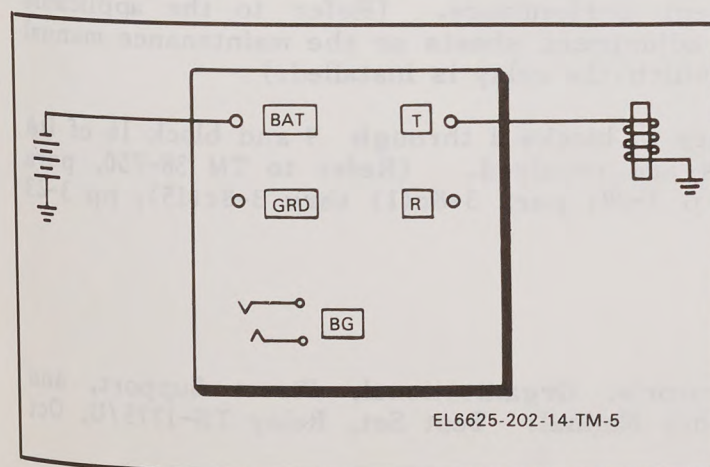


Figure 3. BAT (Battery) Test Connections

SKILL LEVEL 1

- d. Operate and nonoperate relay test using the test set No. 2 circuit and soak circuit (soak current value not specified). (Refer to TM 11-6625-202-14, para 3-6a, 3-6b, 3-6e, 3-7b, and 3-8d, pp 3-4 and 3-5.)
 - e. Operate and nonoperate relay test using the test set No. 1 circuit and No. 2 circuit (soak current value specified). (Refer to TM 11-6625-202-14, para 3-6a, 3-6b, 3-6e, 3-7a, 3-7b, and 3-8e, pp 3-4 and 3-5.)
 - f. Hold test using the test set No. 1 circuit and No. 2 circuit (operate current or soak current value specified). (Refer to TM 11-6625-202-14, para 3-6c, 3-7a, 3-7b, and 3-9a, pp 3-4 and 3-5.)
 - g. Hold test using the test set No. 2 circuit and soak circuit (soak current value not specified). (Refer to TM 11-6625-202-14, para 3-6c, 3-7b, and 3-9b, pp 3-4 and 3-5.)
 - h. Release test using the test set No. 1 circuit and No. 2 circuit (operate current or soak current value specified). (Refer to TM 11-6625-202-14, para 3-6d, 3-7a, 3-7b, and 3-10a, pp 3-4 and 3-5.)
 - i. Release test using the test set No. 2 circuit and soak circuit (soak current value not specified). (Refer to TM 11-6625-202-14, para 3-6d, 3-7b, and 3-10b, pp 3-4 and 3-5.)
12. Determine whether the relay requires further repair based on the standards of equipment performance. (Refer to the applicable manufacturer's relay adjustment sheets or the maintenance manual for the equipment in which the relay is installed.)
 13. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) and 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-6625-202-14, Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Test Set, Relay TS-1775/U, Oct 75.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**031-503-2002**

**Decontaminate Equipment Using ABC-M11
Decontamination Apparatus**

CONDITIONS

In an NBC environment, wearing mask and gloves, given equipment contaminated with a persistent chemical agent, prefilled ABC-M11 decontaminating apparatus and directed to decontaminate the equipment.

STANDARDS

The equipment is decontaminated.

PERFORMANCE MEASURES

WARNING: DS2 is highly corrosive. DO NOT spray on personnel and avoid spraying fabric or clothing. For training, the M11 should be filled with water. It must be dried out thoroughly when finished to avoid rusting.

1. Remove the captive safety pin (fig 1).
2. Grasp the M11 in your left hand (fig 2) and lift up on the charging handle with your right. You should hear a hissing noise which indicates the compressed gas from the nitrogen cylinder has entered and charged the M11.
3. Pick up the M11 by the charging handle. Point it at the object to be decontaminated, hold it 6 to 8 inches away, and depress the thumb lever (fig 3). The charged M11 will last about 30 seconds, so care should be taken to prevent wasting the DS2.

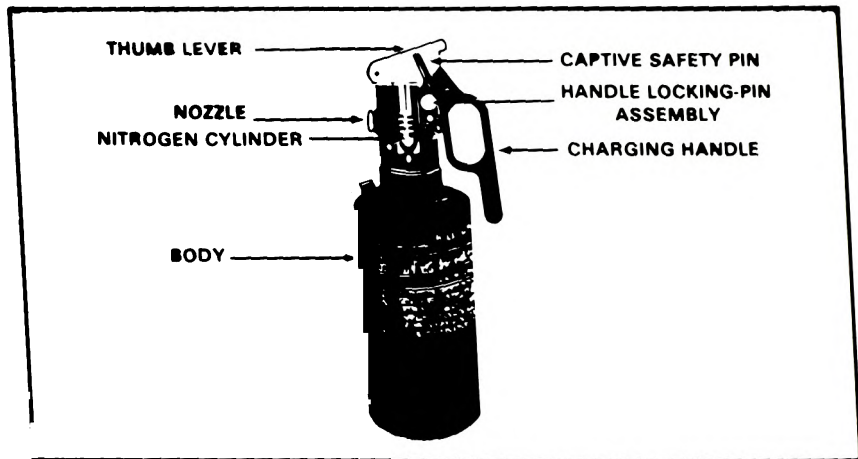


Figure 1. Remove captive safety pin.

4. Having sprayed the contaminated objective, interrupt the spray by removing your thumb from the thumb lever.
5. Depress the handle locking pin, lower the charging handle, and replace the captive safety pin.
6. Follow unit SOP for refilling the M11.

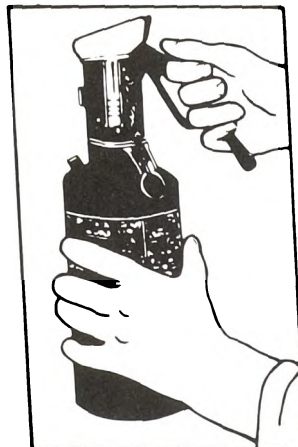


Figure 2. Grasp M11 in left hand.



Figure 3. Pick up M11 by the charging handle.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 chap 5, pp 5-27 and 5-28.

TM 3-4230-204-12&P, Operator's and Organizational Maintenance (Including Repair Parts and Special Tools List): for Decontamination Apparatus, Portable, DS2, 1 1/2-Quart, ABC-M11, Feb 78.

TASK**031-503-2003**

**Place the Automatic Chemical Agent Alarm System
Into Operation**

CONDITIONS

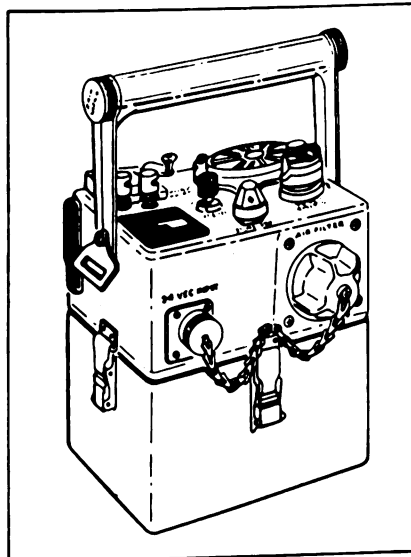
Given an automatic chemical agent alarm, one reel of telephone cable (WD-1), TM 3-6665-225-12, and directed to place alarm into operation.

STANDARDS

1. All components are present.
2. All components are visibly free from defect, those that are not are reported to the supervisor.
3. The alarm is in operation (detects the presence of an agent and alerts).

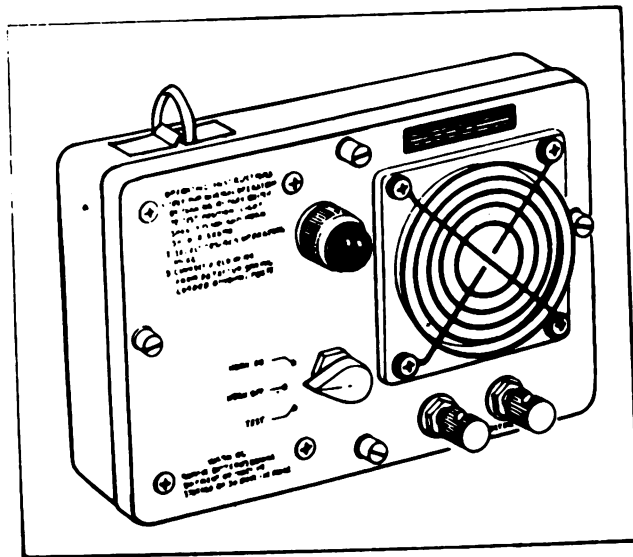
PERFORMANCE MEASURES

1. Check to insure the basic components are present.
 - a. One M43 detector unit.

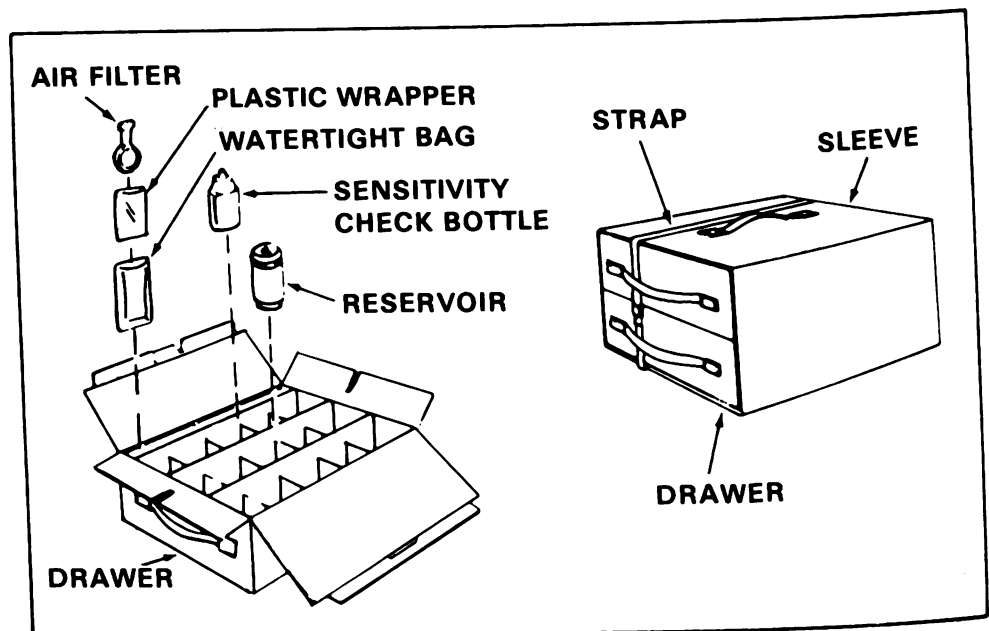


SKILL LEVEL 2

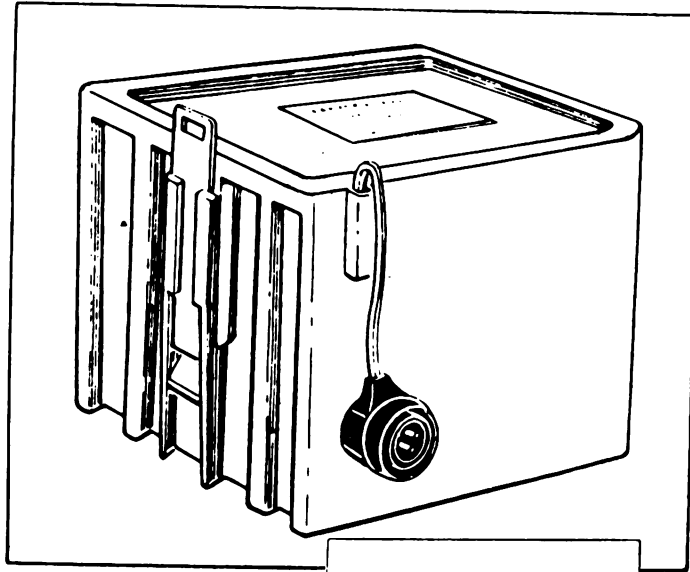
b. One M42 alarm unit.



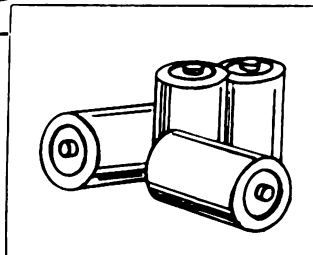
c. One M229 refill kit.



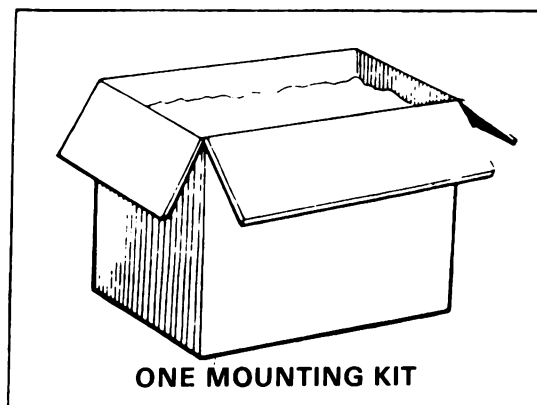
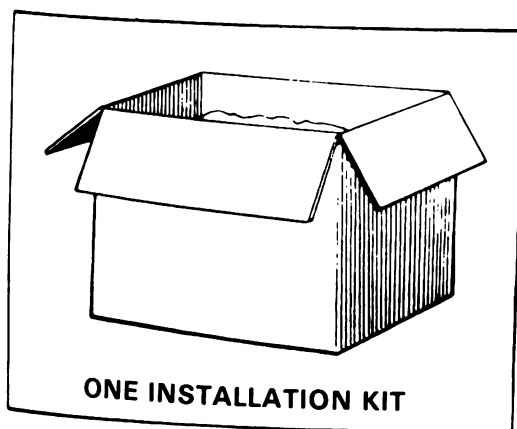
- d. One EA3517/U battery.



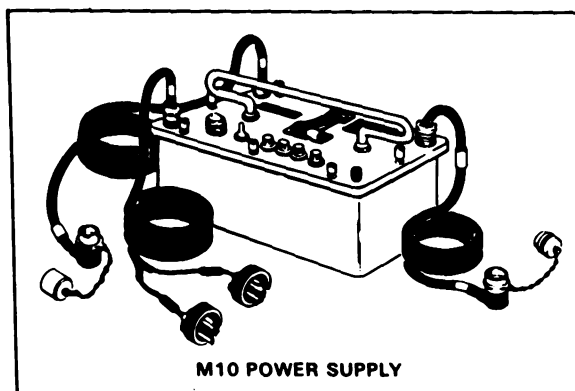
- e. Four BA3030 batteries.



- f. If you have a mobile or mobile/fixed model, you will also have an installation kit and a mounting kit.



Also, the fixed and mobile/fixed models are issued with an additional item, an M10 power supply.



2. Perform preoperational procedures as described in TM 3-6665-225-12, chap 2, para 3-6 or TC 3-3, pp 22 thru 28.
3. Perform prestartup procedures as described in TM 3-6665-225-12, chap 2, para 2-7 or TC 3-3, pp 29 and 30.
4. Install the equipment as a system as described in TM 3-6665-225-12, chap 3, para 3-1 thru 3-4 or TC 3-3, p 31.
5. Start up and operate the alarm system as described in TM 3-6665-225-12, chap 2, para 2-9 or TC 3-3, pp 33 thru 36.

REFERENCES

TM 3-6665-225-12, Alarm, Chemical Agent, Automatic: Portable, Aug 78, chap 2, para 2-6, 2-7, 2-9; chap 3, para 3-1 thru 3-4.

TC 3-3, How To Use the Automatic Chemical Agent Alarm, pp 22 thru 28, Sep 78.

SQT ADMINISTRATIVE INSTRUCTIONS

- Operability of the chemical agent alarm system may be checked by igniting a smoke grenade by the detector unit.

TASK**031-503-2004**

Service the Automatic Chemical Agent Alarm System

CONDITIONS

Given an automatic chemical agent alarm which has been in continuous operation for 12 hours, or has signaled the presence of chemical agents, and command guidance to continue using the alarm.

STANDARDS

The alarm is serviced so that when placed back in operation it detects the presence of chemical agents and alerts.

PERFORMANCE MEASURES**1. Twelve-Hour Servicing Procedure:**

Check and service the alarm after 12 hours of continuous operation as described in TM 3-6665-225-12, chap 2, para 2-10 or TC 3-3, p 37.

2. After Alert Servicing:

- a. Shut down the alarm after an operational alert as described in TM 3-6665-225-12, chap 2, para 2-11 or TC 3-3, p 38.
- b. Reactivate the alarm after an operational alert as described in TM 3-6665-225-12, chap 2, para 2-12 or TC 3-3, p 39.

SKILL LEVEL 2

REFERENCES

TM 3-6665-225-12, Alarm, Chemical Agent, Automatic: Portable,
Aug 75.

TC 3-3, How to Use the Automatic Chemical Agent Alarm.

SQT ADMINISTRATIVE INSTRUCTIONS

Operability of the chemical agent alarm system may be checked by
igniting a smoke grenade near the detector unit.

TASK**071-327-0202**

Lead Physical Conditioning Activities

CONDITIONS

Given a platoon or company size unit in formation, with a requirement to conduct a specified physical activity. (Activity will be predesignated so that time is available for preparation.)

STANDARDS

1. Be physically fit to lead physical conditioning activities.
2. Give enough time between commands to permit the average man to understand the preparatory command before the command of execution is given.
3. Be able to form and control the extended rectangular formation, circle formation, and double-time column (while performing the run portion of physical conditioning activities).
4. Lead each exercise in accordance with FM 21-20.
5. Demonstrate each exercise (at least three repetitions) with cadence.
6. Follow guidance given concerning what, when, where, and how long activity is to be conducted.

PERFORMANCE MEASURES

1. How to Prepare. Once guidance is given concerning the conditioning requirement, preparations must be made.

- a. What is the requirement? You must be familiar with the exercises in FM 21-20 if leading them is your requirement. This will require study and practice. It is also your responsibility to insure that your assistant instructors (if available) know the exercises so they can effectively supervise and demonstrate. If your requirement is, or includes, a conditioning run, you must insure that your road guards (if used), pace men, lead rank, and assistant instructors are proficient enough runners to set a good pace (an example) for the rest of the group.
 - b. When? An assigned starting time is just that. It is your responsibility to insure that the requirement does start on time and a system is set up to deal with late arrivals. Your assistant instructors should note the name of any individual who is late, then place him in the formation. He still needs to take part in the conditioning; he can be sent to his supervisor to explain and be dealt with after the formation.
 - c. Where? Once given a location to perform the requirement, you must determine if it is feasible to do it there and what plans must be made to best fit the requirement to the area. The area must be large enough. If it is a controlled area, you must insure that only you have planned to use it during your requirement time period. If the area becomes useless during bad weather (for example, knee deep in mud when it rains), an alternate area must be secured.
 - d. How long? You will be given a period of time in which to complete the requirement. Plans should be made with an eye to coming as close as possible to the required time without going over it, since improper use of time can snowball through a training day and wreck a unit's schedule and morale. Timing is a function of practice. Rehearse exercises. On a run, match a realistic pace to an appropriate distance. You, not the pace man, are responsible for the pace. Allow yourself a small time leeway and don't make the instructor for the next period suffer for your lack of timing.
2. Preparatory Commands and Commands of Execution. The preparatory command describes and specifies what is required, and the command of execution calls into action what has been prescribed. All preparatory commands are given with a rising inflection. The interval between commands is long enough to permit the average man to understand the first one before the second one is given.

3. Extended Rectangular Formation (fig 1). The formation used most frequently for carrying on physical training activities is the extended rectangular formation. This formation is the best type to use for large numbers of men because it is easy to control. The following commands are given to form this formation.

NOTE: In figure 1, the baseman is represented by a white circle.

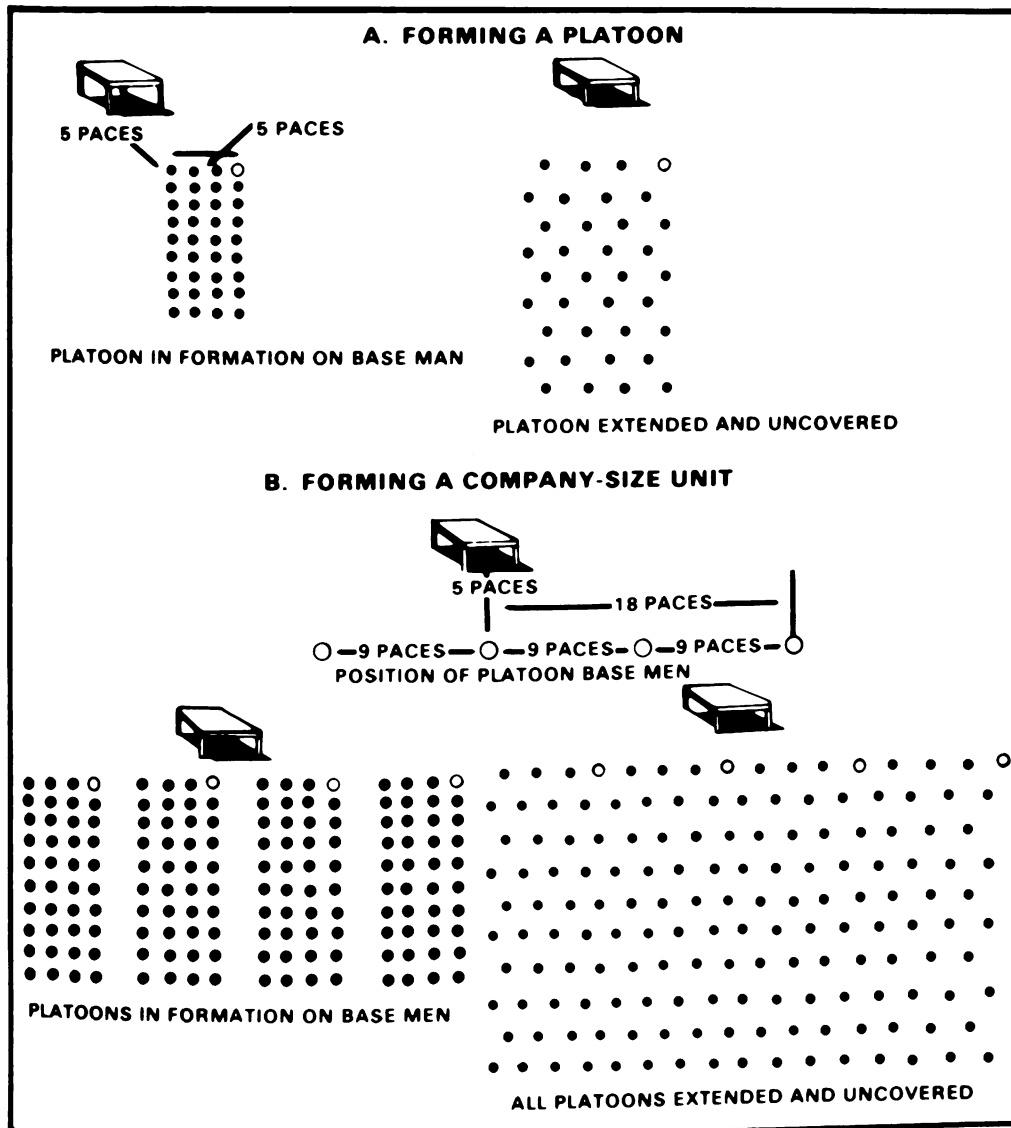


Figure 1. Forming the extended rectangular formation.

- a. FALL OUT AND FALL IN ON THE BASEMAN. At this command, all personnel run to the designated area and re-form. This procedure is preferred to marching the unit into position. If more control is desired, the unit may march at double time to the vicinity of the baseman and then be directed to fall out and fall in on him. Time is wasted in the field due to needless maneuvering of troops at quick time in an effort to position the unit on the exact spot for the exercises.
- b. A company size unit assumes the extended rectangular formation from a column of three's or four's at normal intervals between squads. This extension can also be executed from a company mass without interval between platoons. In extending either a platoon or company size unit, take your place at the head of the column and command.
 - (1) EXTEND TO THE LEFT, MARCH. At this command, the men in the right flank file stand fast with arms extended sideward. All other men turn to the left and run forward at double time. After taking a sufficient number of steps, all men face the front with both arms extended sideward. The distance between fingertips is about 12 inches and dress is right.
 - (2) ARMS DOWNWARD, MOVE. At this command, the arms are lowered smartly to the sides.
 - (3) LEFT, FACE.
 - (4) EXTEND TO THE LEFT, MARCH. At this command, the men in the right flank file stand fast with arms extended sideward. All other men turn to the left and run forward at double time. Spacing is the same as in (1) above and dress is right.
 - (5) ARMS DOWNWARD, MOVE. Same as in (2) above.
 - (6) RIGHT, FACE.
 - (7) FROM FRONT TO REAR, COUNT OFF. At this command, the leading man in each column turns his head to the right rear, calls off "one" and faces the front. Successive men in each column call off in turn, "two," "three," "four," "five," in the same manner.

- (8) **EVEN NUMBERS TO THE LEFT, UNCOVER.** At this command, each even numbered man stride-jumps to the left, squarely in the center of the interval. In doing this, he swings his left leg sideward and jumps from his right foot to his left foot and smartly brings the right into position against the left.
- c. To assemble the unit, command: **ASSEMBLE TO THE RIGHT, MARCH.** At this command, all return to their original position in the column at double time and re-form on the baseman.
- d. It is recommended that the area of grounding equipment and weapons be at the edge of, or well away from the area to be used for exercising. To conserve time and insure proper position of the unit, the baseman or, if the unit is composed of several platoon size groups, the various basemen may precede the unit and establish their positions in relation to the instructor's platform.
4. **Circle Formation.** The circle formation is effective for the conduct of various exercise activities (fig 2). This formation has an advantage in that the supervision of all men is facilitated, and a moving formation is available which provides control. Guerrilla exercises, grass drills, and some forms of running are examples of activities which are more easily conducted in the circle formation than in the extended rectangular formation.

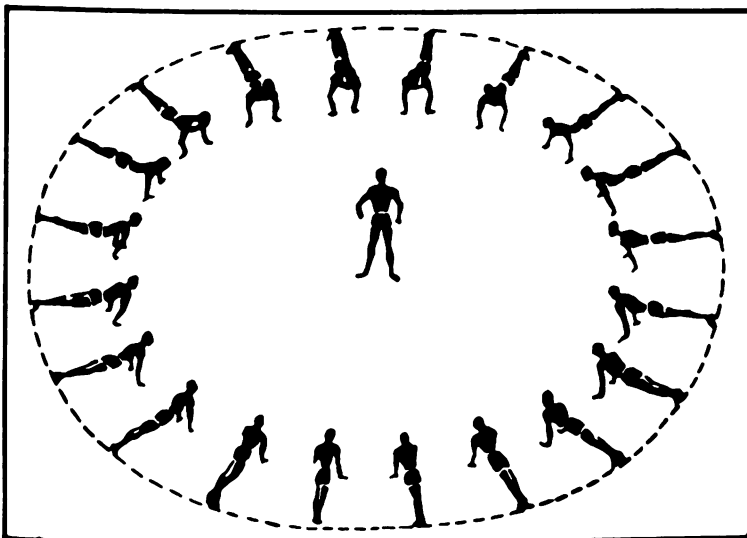


Figure 2. The circle formation.

- a. When a platoon is to form a circle, the commands are CIRCLE FORMATION, MARCH, FOLLOW ME. Upon this command, the right flank squad of the column moves forward at double time with the leader of the platoon group gradually forming a circle in a counterclockwise direction. Each succeeding file falls in behind that on the right. After the rough outline of the circle is formed, the leader commands, PICK UP A FIVE YARD INTERVAL. This is to insure the interval between men is uniform prior to starting exercises.
 - b. The group may be halted and faced toward the center, or if instruction is not necessary, the exercise activity may be executed without stopping the platoon.
5. Conditioning Run. This is nothing more than a column moving over a prescribed course at double time. Reflector-vested road guards must be placed ahead of and behind the column if the course follows a road or vehicle trail. A designated pace man runs in the right guide position and, under the direction of the instructor in charge, sets and maintains the pace for the run. Routes should be selected and announced, if necessary, in accordance with post and unit SOPs.
6. Leadership Techniques.
- a. Unless you experience all the exercises, you cannot appreciate how strenuous they are, what movements are the most difficult, where the errors in performance are likely to occur, and what the proper cadence should be.
 - b. You must give all the men careful supervision and participate in the exercises to show that you can do them. When you participate, your assistant instructors should supervise because it is difficult for you to supervise and exercise simultaneously.
 - c. The men should never be kept too long in one position, especially a constrained one. They should never have to perform so many repetitions of an exercise that they lose the correct form. Slight deviations from the proper form reduce the value of the exercise.
 - d. Avoid long explanations. As a rule, it should be necessary to give a full explanation of new exercises only once. Minor corrections should be made to the entire class while the exercise is in progress (for example, "heads up," "knees straight"). If necessary, follow this correction by the name of the man who is at fault.

- e. The heavy demand on your voice can be lightened by training assistant instructors to assume some of the instruction and by employing mass cadence.
- f. Insure each exercise is performed in accordance with FM 21-20. Review and practice is usually required in order to perform them properly.
- g. Use of a cue card (3 x 5 or scrap of paper) is recommended while leading exercises. This will prevent forgetting any exercise and help present a smooth period of training.

REFERENCES

FM 21-20, Physical Readiness Training, Mar 73.

TASK

071-328-5301

Inspect Personnel/Equipment

CONDITIONS

Given personnel or equipment to be inspected, specified amount of time, inspection site, and unit SOP for inspections.

STANDARDS

Within the time specified, inspect personnel or equipment and note deficiencies.

PERFORMANCE MEASURES

1. Personnel.

- a. Start at the head. Check headgear, haircut, and shave.
- b. Inspect collar insignia and awards.
- c. Check gig line and belt buckle.
- d. Check footgear.
- e. Check uniform for general appearance, fit, and patches.
- f. Check Identification Card (DD Form 2A) and ID tags.

NOTE: Before inspecting, be thoroughly familiar with unit standards.

2. Equipment.

- a. Before inspection, study applicable TM. Pay particular attention to section on preventive maintenance checks and service and the basic issue items list.

- b. Begin inspection at a readily recognizable point on equipment.
- c. Inspect in an orderly sequence. This saves motion and eliminates chances of missing important items.
- d. Note deficiencies as you find them. Don't try to remember all of them.
- e. Inspection should be complete when you return to the starting point.

REFERENCES

FM 22-5, Drill and Ceremonies.

TASK

071-328-5302

Supervise Maintenance on Individual and TOE Equipment

CONDITIONS

Given personnel, with equipment to be maintained, a maintenance site, and specified amount of time.

STANDARDS

Within time specified, direct personnel assigned to your unit in the proper maintenance of individual or TOE equipment to meet Army standards as listed in applicable TM or other publications.

PERFORMANCE MEASURES

To supervise maintenance on individual and TOE equipment:

1. Determine what is to be maintained.
2. Obtain applicable TM.
3. Brief personnel on maintenance to be performed and standards.
4. Assign tasks as stated in TM, when applicable.
5. Allocate resources if necessary.
6. Spot check (DO NOT OVERSUPERVISE).
7. Obtain assistance if needed.
8. Inspect completed work and make corrections if necessary.
9. Report completion of work to your supervisor.

NOTE: Be sure that the task is understood, supervised, and accomplished.

REFERENCES None.

TASK**071-328-5304**

**Enforce Preventive Medicine Program
(Includes Personal Hygiene)**

CONDITIONS

Your squad has been given the mission to conduct a march. As team leader, brief your men on preventive medicine measures that should be taken. A march can be tactical or administrative and can be conducted by road and cross country, and can be conducted in daylight or hours of darkness.

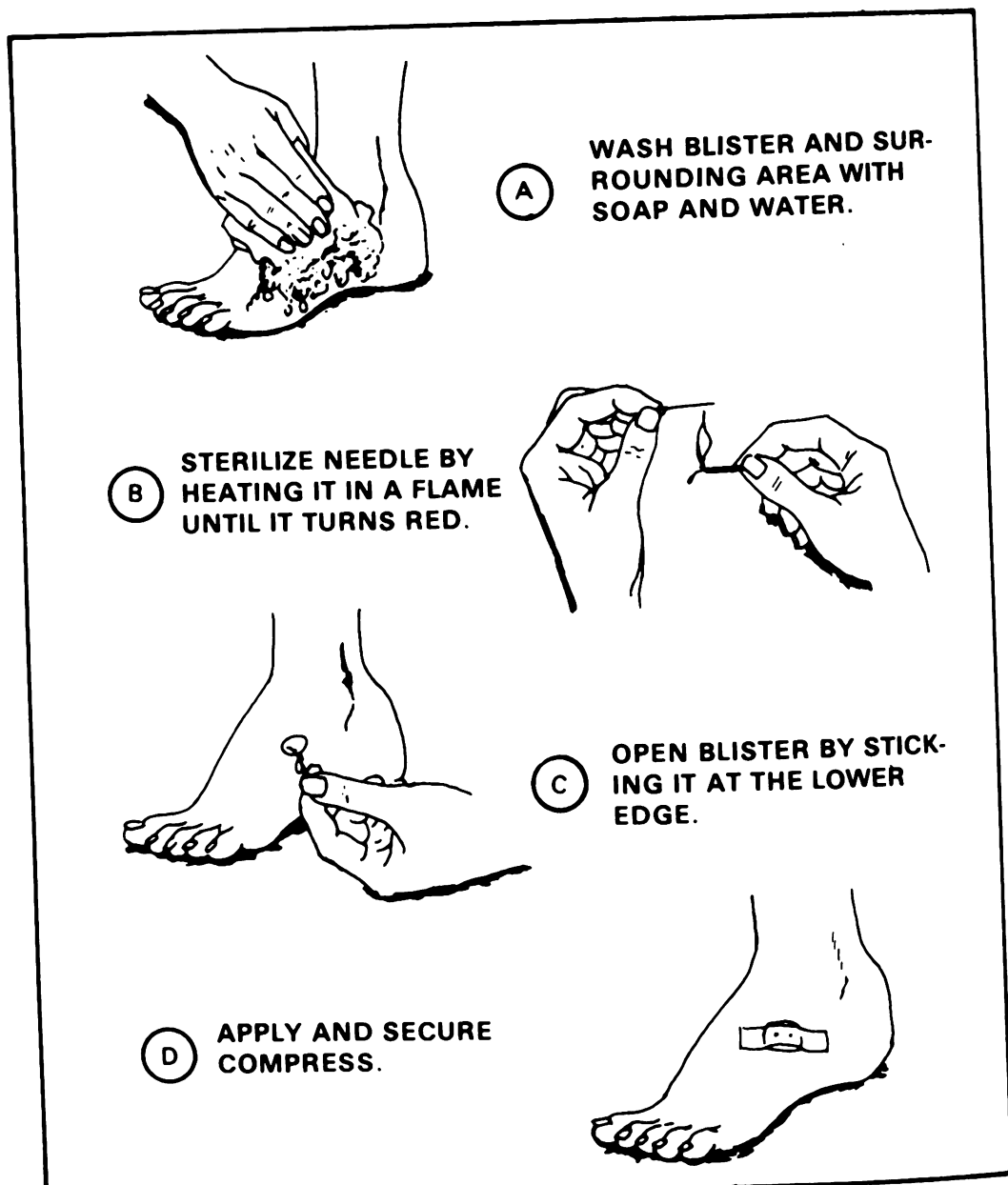
STANDARDS

Prior to conduct of the mission, you will explain preventive medicine measures for--

1. Care of the feet prior to and during the march.
2. Purifying water with iodine tablets.
3. Disposal of human waste while on the march and during bivouac.
4. Climatological injuries, heat/cold. During conduct of the mission, inspect your subordinates to insure that they are complying with your instructions. Detect all failures to comply with your instructions and insure corrections are made.

PERFORMANCE MEASURES

1. Care of the Feet.
 - a. Prior to the march, all men should be equipped with the proper type of correctly fitted, broken-in footgear, clean socks which are free of holes or knotty darns, and an adequate supply of foot powder. A soldier must never attempt to break in a new pair of shoes or boots on a long march. Blisters, pressure spots, and infections should be treated and properly protected before the march starts.



- b. On the march, the feet should be kept as dry as possible. If socks become damp from perspiration or wet from water, they should be changed to dry ones at the first opportunity. If necessary, socks may be dried by putting them under the shirt around the waist. Tender pressure spots should be relieved promptly by adjusting gear or applying adhesive tape. Once or twice daily during the march, the feet should be dusted lightly with foot powder.

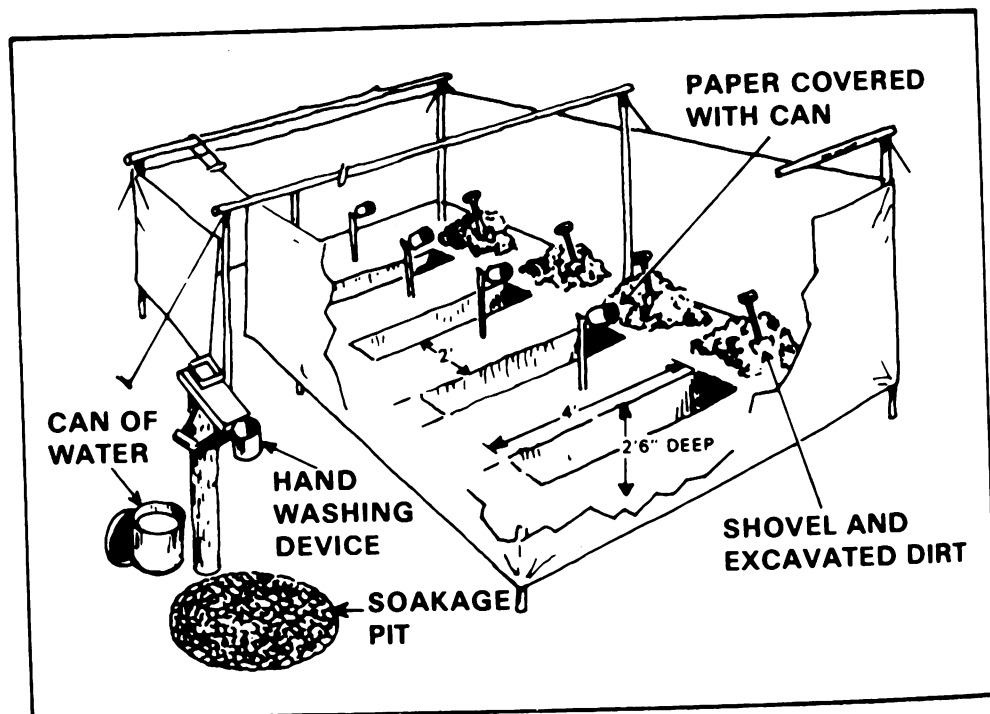
- c. At rest periods, the feet should be inspected (from time to time). If possible, the feet should be washed during the noon break. It is helpful to elevate the feet while resting. This reduces congestion and swelling.

2. Purifying Water.

- a. Before iodine tablets are used, they should first be checked for physical change because they lose their disinfecting ability in time. Tablets which are not steel gray in color, which are stuck together, or which are crumbled should not be used.
- b. The following procedure is used in treating water in a canteen with iodine tablets.
 - (1) Fill canteen with the cleanest, clearest water available.
 - (2) Add one iodine tablet to a 1-quart canteen of clear water; add two tablets if the water is cloudy. Double these amounts for a 2-quart canteen.
 - (3) Place the cap on the canteen loosely, wait 5 minutes, then shake the canteen well, allowing leakage to rinse the threads around the neck of the canteen.
 - (4) Tighten cap and wait an additional 20 minutes before using the water for any purpose.

3. Human Solid Waste Disposal.

- a. When on a march, each person uses a "cat-hole" latrine during short halts. It is dug approximately 1-foot deep and is completely covered and packed down after use.
- b. For overnight bivouac, the straddle trench is used. Construction requirements are found in FM 21-10, paragraph 76.



4. Climatological Injuries.

a. Preventing heat injuries:

- (1) Water requirements: The human body cannot be trained to function with less than the minimum amount of water it requires for cooling, waste elimination, and metabolism. Any attempt to train the body to do so can be harmful and lead to heat injuries. Troops should be encouraged to drink water more frequently than is necessary to quench sensations of thirst.
- (2) Salt requirements: When water is lost through perspiration, vital body salt is also lost. An ordinary person contains enough salt to make up this loss when a person's water intake is less than 1 gallon a day. If daily water intake increases, the soldier should lightly salt his food from his field rations pack.

NOTE: First aid for heat injuries is found in FM 21-11.

b. Preventing cold injuries.

- (1) Clothing for cold weather is designed to afford protection, insulation, and ventilation; protection by covering as large an area of the body as possible; insulation by trapping air which has been warmed by the body and holding it near the skin to prevent loss of heat from the body; ventilation by allowing a two-way exchange of air through the various layers of clothing. This exchange of air prevents overheating and excessive perspiring. Clothing should be worn in layers and loose enough to allow movement and exercise of hands, feet, and other parts of the body. The clothing should also be clean and dry.
- (2) Good circulation should be maintained by exercising the feet and legs. This is especially important during rest breaks.
- (3) It is advisable that troops in cold weather be paired as "buddies," each having the responsibility for reminding the other to take warming exercises at frequent intervals and watching for signs of frostbite and trench foot. FM 21-11 gives signs and first aid for cold-weather injuries.

REFERENCES

- FM 21-10, Field Hygiene and Sanitation, Jul 70.
- FM 21-11, First Aid for Soldiers, Jun 76.
- TEC Lesson 929-441-0042F, Personal Hygiene: Care of the Feet.
- TEC Lesson 929-441-0043F, Environmental Hazards, Part 1: Treatment of Drinking Water.
- TEC Lesson 911-441-0034F, Snake Bites and Hot Weather Hazards.
- TEC Lesson 911-441-0035F, Cold Weather Hazards.

TASK

071-331-0807

Enforce Noise, Light, and Litter Discipline

CONDITIONS

As the leader of a unit conducting any tactical mission (defense, offense, etc.) during daylight or the hours of darkness.

STANDARDS

The leader will insure that:

1. Noise is kept at a minimum.
2. No light is visible to the enemy.
3. The area is free of litter and other evidence of the unit's presence.

PERFORMANCE MEASURES

1. Noise Discipline:
 - a. Avoid unnecessary vehicular and foot movement.
 - b. Tape or otherwise secure metal parts (weapon slings, canteen cups, ID tags, etc.) to prevent them from making noise when contacting each other. Be careful that restricting moving parts of weapons does not prevent their operation.
 - c. Talk only when necessary to conduct or plan operations. Use radios only when necessary. Keep volume low so they can be heard only by the operator. Wire communications should be used whenever possible, especially in the defense.

2. Light Discipline:

- a. Don't allow smoking except when concealed from possible enemy view. Discourage smoking at night; the enemy can see and smell it.
- b. If flashlights or other lights are used, they must be filtered and concealed, such as underneath a poncho.
- c. Cover anything that shines or glares (metal surfaces, vehicles, glass, etc.).
- d. Use all available natural concealment and camouflage vehicles, equipment, etc.

3. Litter Discipline:

- a. When occupying fixed positions, establish collection points for disposal of empty food containers, empty ammo boxes, old camouflage, dirt from defensive positions, etc. During movement, carry litter until it can be disposed of without leaving any trace.
- b. Conceal unused equipment from enemy view.

REFERENCES

FM 21-75, Combat Training of the Individual Soldier and Patrolling.

TEC Lesson 935-071-1029-F, Counterintelligence.

TASK**874-896-2010**

Prepare to Conduct Individual Training

CONDITIONS

Given a requirement to train a specified number of soldiers on a soldier's manual task; the applicable soldier's manual; an outline for training; and access to training aids, devices, facilities, and areas.

STANDARDS

1. Arrange to obtain sufficient resources to train the number of soldiers specified and to conduct a rehearsal.
2. Prepare the area and all equipment for the rehearsal and training session.
3. Conduct a supervised rehearsal that includes:
 - a. A training statement.
 - b. Safety requirements to be observed during training (if any).
 - c. A pretest (if applicable).
 - d. An orientation statement.
 - e. A demonstration (if applicable).
 - f. Training on each task step.
 - g. Skill practice and feedback.
 - h. A post test (performance test).
 - i. Record the results of training.

PERFORMANCE MEASURES

1. Review the task for training to be sure that you can perform to standard. If you cannot perform to standard, review any TEC lesson or training literature (i.e., SM or training plans, ACCP, correspondence courses, etc.) that will help you master the task. Then have your supervisor or a peer give you the performance test to make sure that you can perform to standard.
2. Identify the equipment, training areas, and training devices you will need to train the task. Also identify any preparations you must make before the training session. For example, partial disassembly of the equipment or marking the training area. Check the conditions statement of the training objective to see what preparations are required.
3. Make arrangements to obtain all the resources identified for the rehearsal and training session. Obtain and prepare your rehearsal and training resources as each is needed.
4. Have a peer or supervisor watch your rehearsal and make a critique. Remember a rehearsal is not a show. It is an opportunity to check your preparations and practice the sequence you will use later during the actual training session. To get the most out of your rehearsal, you should treat the person who is making a critique as a trainee and provide the same training you plan to give during the actual training session.
5. Use the training outline to conduct the rehearsal.
 - a. Give a Training Statement. In your own words, tell the soldiers what they have to do, under what conditions, and how well they have to do it (task, conditions, and standards).
 - b. State the Safety Requirements. Tell the soldiers the safety points you expect them to observe during the session. You can get these safety requirements from the training outline.
 - c. Pretest the Soldier. Ask the soldiers if they think they can perform the task to standard. Those who indicate they can perform the task must pass the actual performance test before receiving credit for the task. If they can perform the task, make the correct entries in the job book and use them as assistant (peer) trainers. Those who cannot perform the task will attend training. Sometimes a pretest is not possible. For example, when you take the soldiers to the range to qualify with their weapons, you will not be able to pretest because of range operating procedures.

- d. Give an Orientation Statement. Explain to the soldiers why these tasks are important. The importance of some tasks is obvious and does not require explaining; but when an explanation is necessary, try to show the task's relationship to the soldier's job or the unit's mission.
- e. Include a Demonstration. If you feel it will help the soldiers learn the task quicker or make it easier for them, include a demonstration. An example of a demonstration is to show the soldiers a finished product, such as a properly constructed and camouflaged foxhole. Remember, you are the one who decides if a demonstration is useful.
- f. Include Training on Each Task Step. This is what the trainer does to get the soldiers trained so that they can practice the task. This is normally a talk-through or demonstration walk-through of the task steps. The important thing is to get the soldiers doing the steps with a minimum amount of talk and delay.
- g. Include Skill Practice and Feedback. Watch the soldiers perform the task. Point out and correct all errors they make. Remember to keep the standards in mind so that you can help them. When they meet the standards and are ready for the performance test, have them notify you that they are ready to be tested.
- h. Conduct the Performance Test. This is the test you give to make sure the training objectives have been met. If the soldier fails the performance test, tell him what he did wrong and how to correct his errors; and have him practice again until he is ready for another performance test. The only way for the soldier to get credit for training is to pass the performance test.
- i. Record the Results of the Training. You can use the job book for your section or squad or you can record the results in the soldier's manual.

REFERENCES

FM 21-6, How to Prepare and Conduct Military Training.

TASK**874-896-2020**

Conduct Individual Training

CONDITIONS

Given a requirement to train a specified number of soldiers on a soldier's manual task; the applicable soldier's manual; an outline for task training; adequate time; and access to training aids, devices, facilities, and areas.

STANDARDS

1. Each soldier identified for training must perform the soldier's manual tasks to standard.
2. Training must include:
 - a. The training statement.
 - b. The safety requirements (if any).
 - c. Pretest (if appropriate).
 - d. The orientation statement.
 - e. A demonstration (if appropriate).
 - f. Training in each task step.
 - g. Skill practice and individual feedback.
 - h. A performance test.
 - i. Recording and reporting the results of training.

PERFORMANCE MEASURES

1. Conduct the Training Session:
 - a. Give a training statement.
 - b. State the safety requirements.
 - c. Pretest (if appropriate). Ask the soldiers if they can pass the performance test. Give the performance test to those soldiers who say they can perform the task. Use the soldiers who pass the pretest as assistant (peer) instructors. Those who say they cannot do the task should go right into training. The results of the pretests determine what training the soldiers need to get them ready to pass the performance test. This means that if a soldier missed only one step during the pretest, tell him what he did wrong and how to correct it, let him practice, and then test him rather than make him sit through a demonstration and orientation he doesn't need.
 - d. Give orientation statement.
 - e. Conduct demonstration (if appropriate).
 - f. Train soldiers in each task step. Conduct only the training necessary to get the soldiers ready to practice on their own. Demonstrate each step and let them practice the step.
 - g. Conduct skill practice. The key to a good training session is to involve the soldiers in supervised skill practice as soon as possible and give them the performance test.
 - h. Conduct the performance test. Be sure that each of the soldiers passes the performance test before he is given credit for training.
2. Record the Results of Training. If there is no job book for the skill level of the training, you may want to record the results of this training in a soldier's manual or a commander's manual. Remember, no matter what system you use, it is your record; and the information will help you plan the training your soldiers need.

3. Report the Results of Training. (Provide feedback/input.) Inform your commander/supervisor of the results of the training. Did training occur? Is additional time needed? How many soldiers failed/passed the performance test? Is training needed to correct problems with related tasks, etc.? The commander relies on your knowledge of your soldier's proficiency to keep him informed of the status of training within the unit. This is not always done in a meeting, but may take place any time you have the opportunity to speak with your commander. Unit SOP may require "training meetings" to be held regularly, but this is not the only time you pass on information about your soldiers.

NOTE: Training soldiers is not just following a sequence of events. It involves your giving what you know to soldiers who are trying to learn. All the knowledge and skills you have learned in becoming a noncommissioned officer must be put into practice when you conduct training. You have the skills and knowledge of a leader, so it is important that you polish training skills and become a trainer capable of sharing that knowledge.

REFERENCES

FM 21-6, How to Prepare and Conduct Military Training, Nov 75.

SQT ADMINISTRATION REQUIREMENTS

This task can only be properly verified as a Performance Certification Component (PCC) of the SQT.

Chapter 3

DUTY POSITION TASKS

This chapter deals with duty positions and duty position tasks common to Dial/Manual Central Office Repairer. Skill Level 1 and Skill Level 2 duty position tasks are included. It is your duty to master all the tasks for Skill Level 1. When you feel that you can perform these tasks, you should start on the tasks for Skill Level 2.

TASK LIST

MANUAL CENTRAL OFFICE REPAIRER

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TASK

113-600-0002

Troubleshoot Telephone Assembly TA-312/PT

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Telephone Assembly TA-312/PT with suspected malfunction.
2. DA Form 2407 with telephone set trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Operational line to a common battery switchboard (if available).
6. Operational Telephone Assembly TA-312/PT (or equivalent, for testing purposes).
7. Length of Wire WD-1/TT.
8. Pen.
9. TM 11-5805-201-35.
10. TM 38-750.

Supervision and assistance are available.

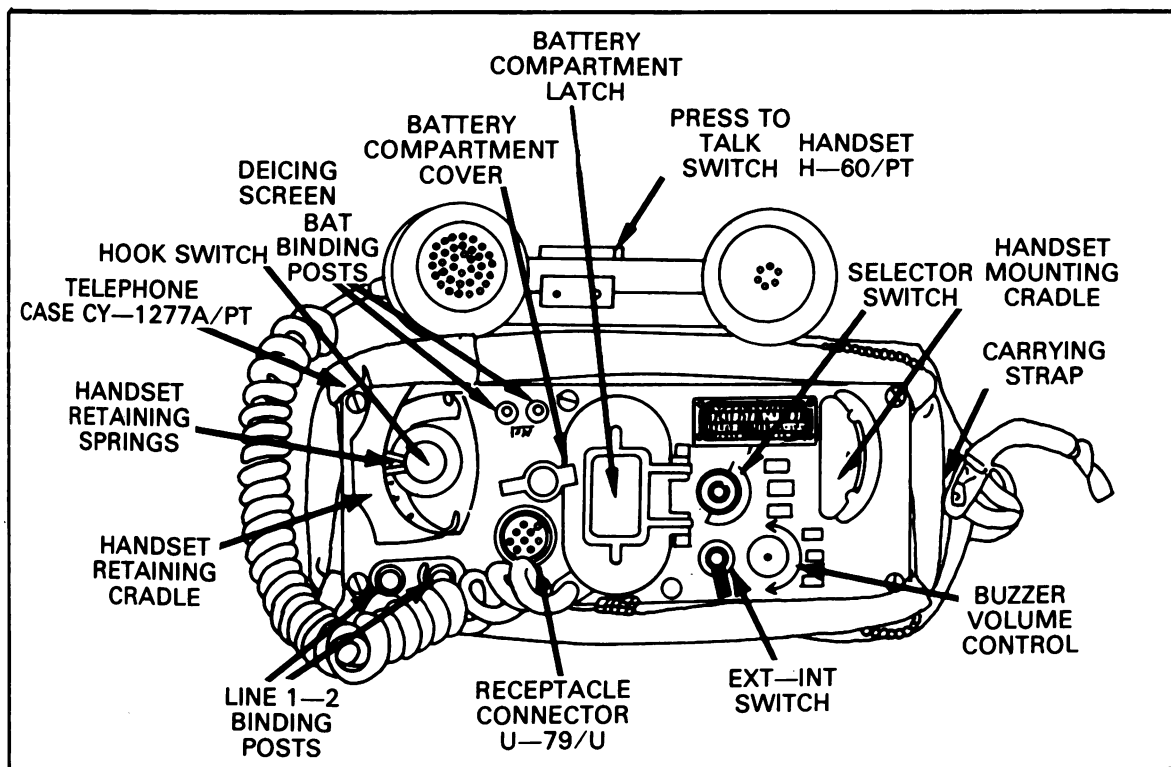


Figure 1. Telephone Set TA-312/PT

STANDARDS

Task standard has been completed when the causes of the telephone set trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the mechanical components of the telephone set for defects that can be observed easily. (Refer to TM 11-5805-201-35, para 3-3b, p 3-2.)
4. Perform operational tests of the telephone set. (Refer to TM 11-5805-201-35, para 3-3a, pp 3-1 and 3-2.)
5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in Steps 2 and 4 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-5805-201-35, para 3-4, pp 3-3 and 3-4.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in Step 5. (Refer to TM 11-5805-201-35, para 3-4 thru 3-5, pp 3-3 thru 3-5.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-201-35, w/C1, Direct Support, General Support and Depot Maintenance Manual, Including Repair Parts and Special Tools Lists: Telephone Set TA-312/PT, Sep 67.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

DVC 11-3, TA-312/PT Telephone Trainer.

TASK**113-600-4002**

Repair Telephone Assembly TA-312/PT

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Telephone Assembly TA-312/PT.
2. DA Form 2407 with the equipment defects listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Operational Telephone Assembly TA-312/PT (or equivalent telephone set, for testing purposes).
5. Operational line to a common battery switchboard (if available).
6. Tool Kit TE-49.
7. Multimeter TS-352B/U (or equivalent multimeter).
8. Length of Wire WD-1/TT.
9. Clean dry lint-free cloth.
10. Cleaning compound.
11. Gasket compound.
12. Aircraft and instrument grease (GL).
13. Paraffin wax.

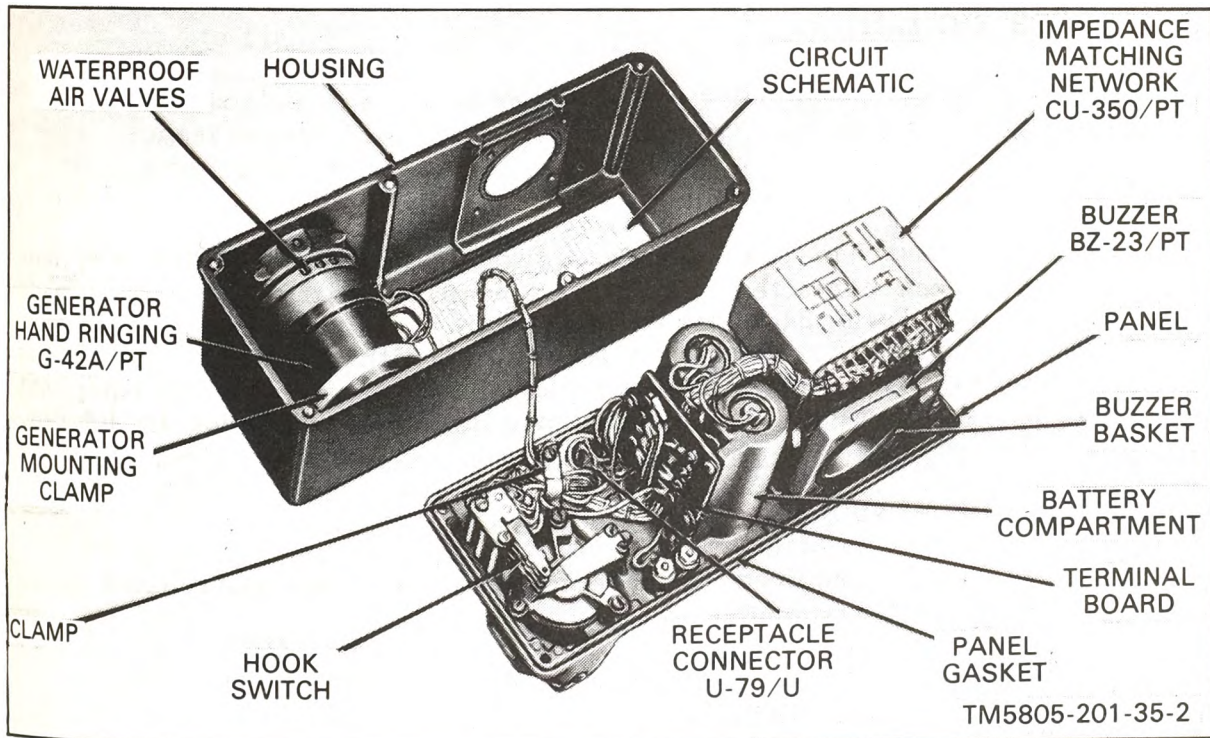


Figure 1. Telephone Assembly TA-312/PT (Panel Assembly Removed from the Housing)

14. Technical talcum powder.

15. Pen.

16. TM 11-5805-201-35.

17. TM 38-750.

18. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the telephone set have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the defects listed in column 20 of the DA Form 2407.
3. Remove the component(s) or part(s) to be replaced or adjusted, and those that must be removed to gain access to items to be removed or adjusted. (Refer to TM 11-5805-201-35, para 3-6 thru 3-17, 3-19 thru 3-23, pp 3-5 thru 3-18; TB SIG 222, para 84 thru 89, pp 68 thru 71, and para 55 thru 59, pp 2 thru 6.)

NOTE: If no components require disassembly, go to step 5.

If buzzer adjustment is the only repair required, go to step 8.

4. Disassemble the component(s) containing part(s) to be replaced. (Refer to TM 11-5805-201-35, para 3-6, p 3-5; para 3-9, pp 3-7 and 3-8.)

5. Clean dirty, dusty or corroded parts and components. (Refer to TM 11-5805-201-35, para 3-24, p 3-18.)
6. Lubricate the points if the original lubricant was removed during the preceding steps. (Refer to TM 11-5805-201-35, para 3-25, p 3-18.)

NOTE: If no components were disassembled in step 4, go to step 8.

7. Reassemble the component(s), substituting serviceable part(s) for unserviceable item(s). (Refer to TM 11-5805-201-35, para 3-6, p 3-5; para 3-9, p 3-8.)

NOTE: If the Buzzer BZ-23/PT, does not require adjustment, go to step 9.

8. Adjust the Buzzer BZ-23/PT. (Refer to TM 11-5805-201-35, para 3-18, p 3-13.)
9. Reassemble the telephone assembly, substituting serviceable part(s) and component(s) for unserviceable item(s). (Refer to TM 11-5805-201-35, para 3-6 thru 3-17, 3-19 thru 3-23, pp 3-5 thru 3-18; TB SIG 222, para 84 thru 89, pp 68 thru 71, and para 55 thru 71, pp 2 thru 6.)
10. Perform operational tests on the telephone set. (Refer to TM 11-5805-201-35, para 3-3a, pp 3-1 and 3-2.)
11. Perform steps 3 through 9 as required until the telephone set meets the standards of equipment performance. (Refer to step 10.)
12. Record the entries required in 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
13. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-5805-201-35, w/C1, Direct Support, General Support and Depot Maintenance Manual, Including Repair Parts and Special Tools Lists: Telephone Set TA-312/PT, Sep 67.

SKILL LEVEL 1

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

TASK**113-594-0004**

Troubleshoot Switchboard Signal Assembly TA-207/P

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Switchboard Signal Assembly TA-207/P (jack field section) from a Manual Telephone Switchboard SB-86/P with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Two Manual Telephone Switchboards SB-86/P, in operating condition.
4. Two Telephone Sets TA-312/PT (or equivalent telephones with both local battery and common battery signaling capabilities).
5. Tool Kit TE-49.
6. Multimeter TS-352B/U (or equivalent multimeter).
7. Test Set Relay TS 1775/U (or Test Set I-181 or equivalent).
8. Pen.
9. TM 11-4134.
10. TM 11-2134.
11. TM 38-750.

Supervision and assistance are available.

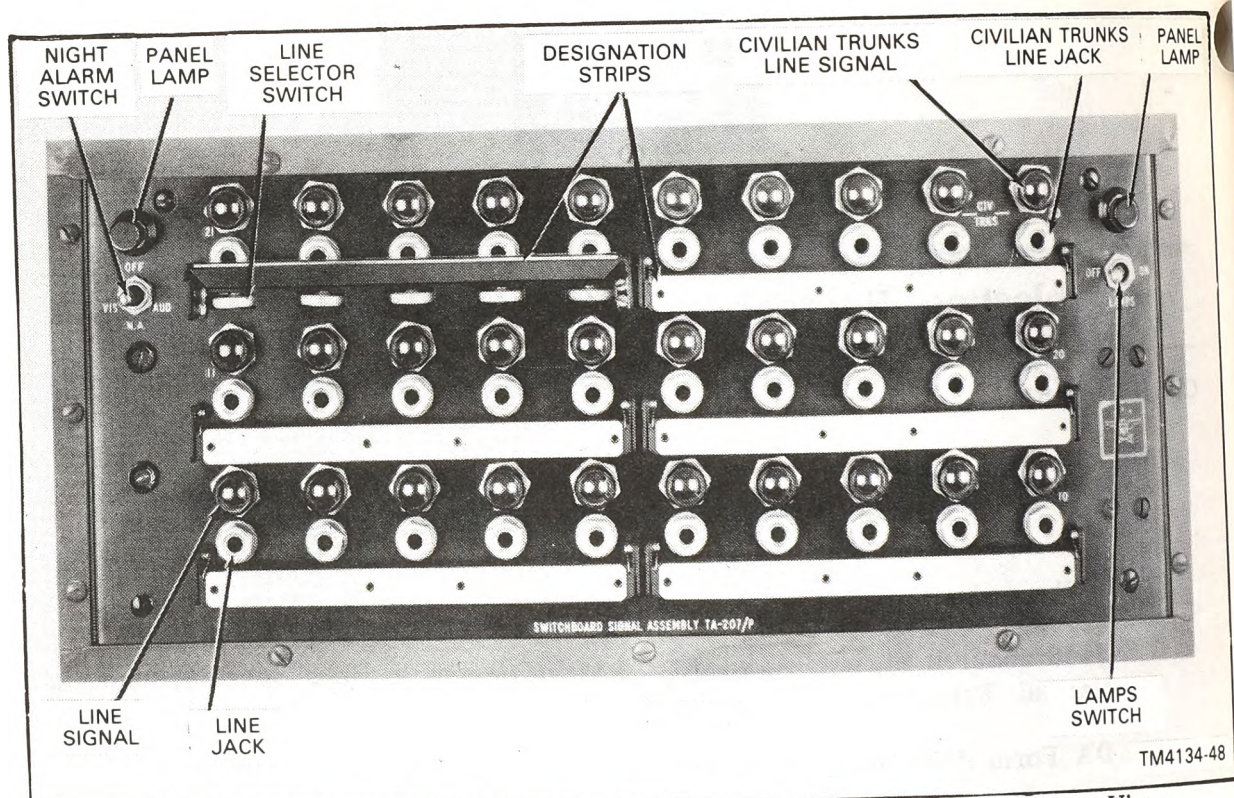


Figure 1. Switchboard Signal Assembly (JackField Section), Front View

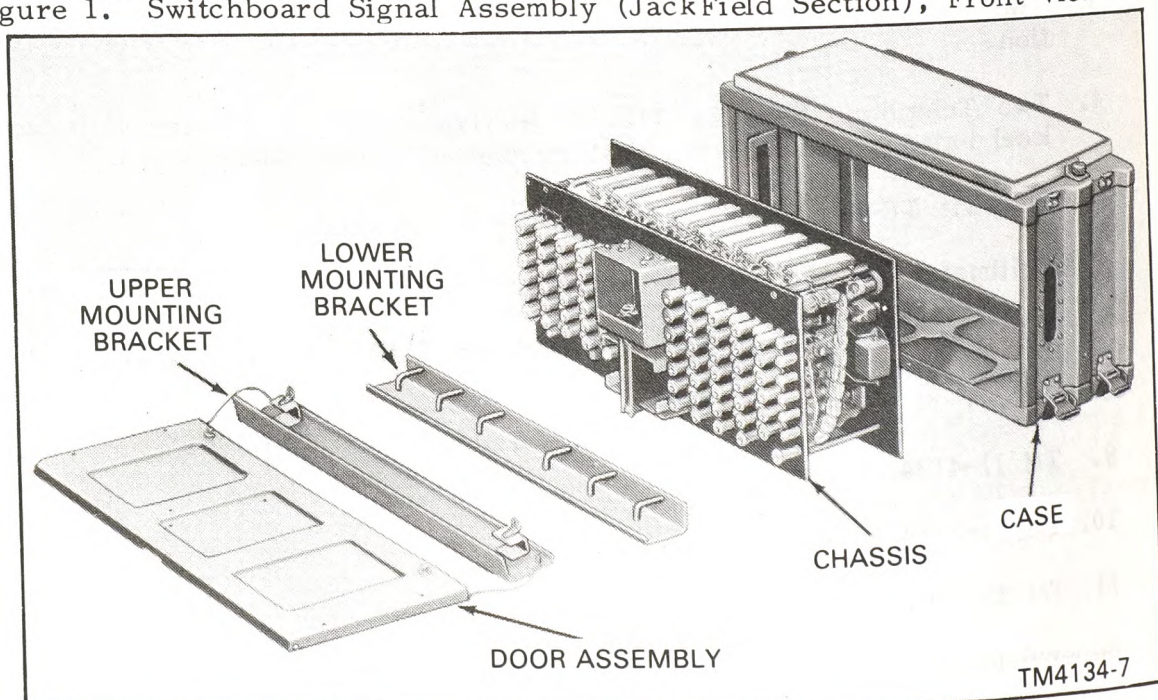


Figure 2. Jack Field Section, Partially Disassembled

STANDARDS

Task standard has been completed when the causes of the switchboard signal assembly trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the switchboard signal assembly (jack field section) chassis from its case. (Refer to TM 11-4134, para 30, p 28.)
4. Inspect the switchboard signal assembly (jack field section) for visible defect. (Refer to TM 11-4134, para 24a, p 19.)
5. Reassemble the jack field section. (Refer to TM 11-4134, para 30, p 28.)
6. Install the jack field section on the keyshelf section of the switchboard. (Refer to TM 11-2134, para 31a(2), 31a(3), 31b, pp 28 thru 30.)
7. Connect the wires from the keyshelf section to the jack field section. (Refer to TM 11-2134, para 23, pp 25 and 26.)
8. Perform the operational tests to identify all trouble symptoms. (Refer to TM 11-4134, para 28c thru 28f, pp 23 thru 25.)
9. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 8 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
10. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 9. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
11. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

12. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-4134, w/C1 thru 3, Manual Telephone Switchboard SB-86/P; Field Maintenance, Sep 55.

TM 11-2134, w/C1 thru 5, Manual Telephone Switchboard SB-86/P; Installation and Operation, Sep 55.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 411, Local-Battery Telephone Switchboards.

TASK**113-594-0005**

Troubleshoot Cord Telephone Circuit TA-208/P

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Cord Telephone Circuit TA-208/P (cord pack) from a Manual Telephone Switchboard SB-86/P with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Two Manual Telephone Switchboards SB-86/P, in operating condition.
4. Two Telephone Sets TA-312/PT (or equivalent telephones with both local battery and common battery signaling capabilities.)
5. Tool Kit TE-49.
6. Multimeter TS-352B/U (or equivalent multimeter).
7. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent).
8. Pen.
9. TM 11-4134.
10. TM 11-2134.
11. TM 38-750.

Supervision and assistance are available.

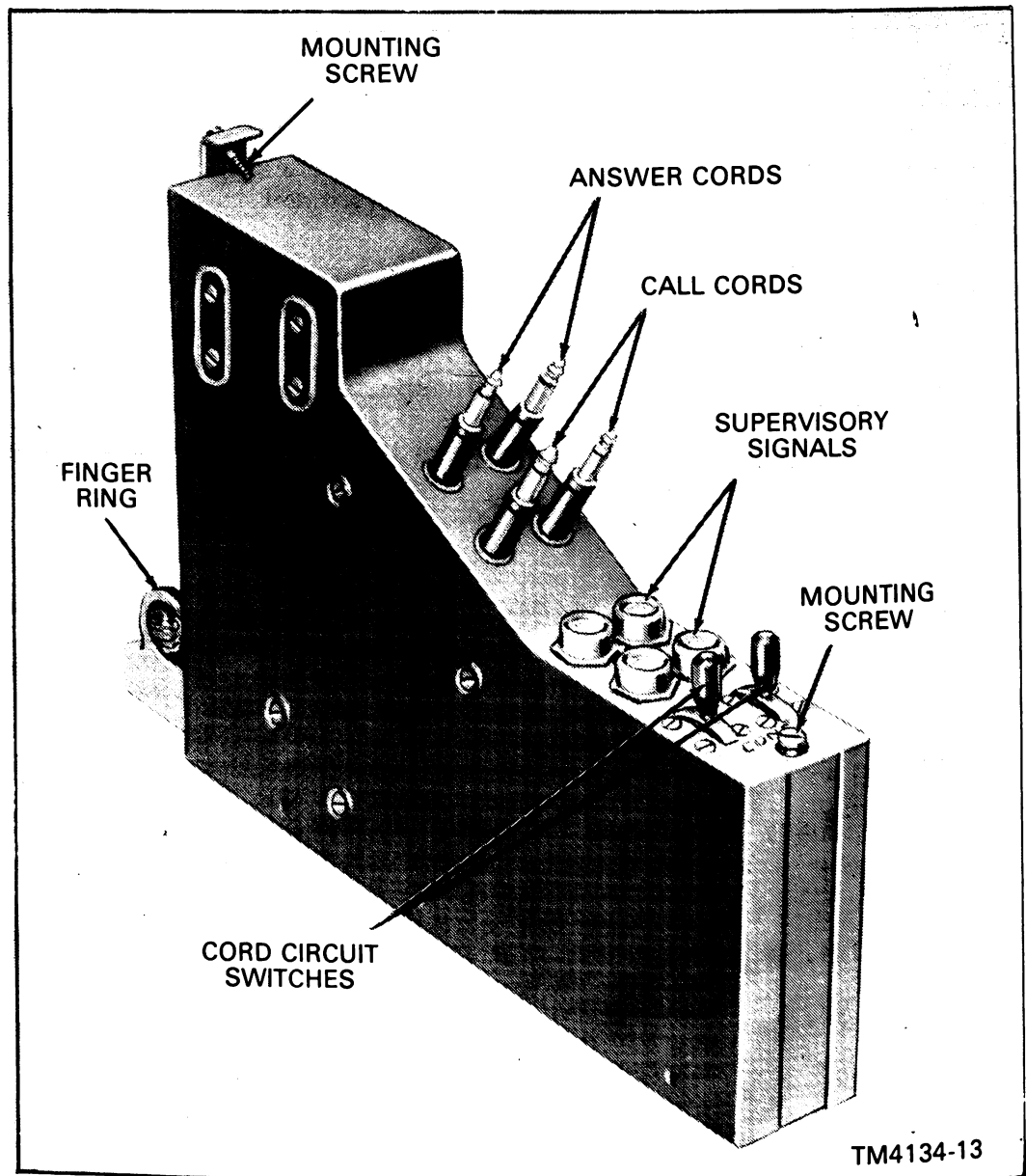


Figure 1. Cord Telephone Circuit TA-208/P (Cord Pack)

STANDARDS

Task standard has been completed when the causes of the cord telephone circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the screws and cover from the right side of the cord telephone circuit (cord pack). (Refer to TM 11-4134, para 33a, p 31.)

NOTE: The eight screws on the left side of the cord pack will be left intact.

4. Inspect the cord telephone circuit for visible defects. (Refer to TM 11-4134, para 24a, p 19.)
5. Replace the cover and cover screws on the cord pack.
6. Slide the cord pack into its place in the keyshelf section of the switchboard while holding the terminal connector and the multiple cable to one side.

NOTE: When sliding the cord pack into position, do not allow the cord pack mounting screws to bind on the keyshelf section.

Fit the terminal connector onto the terminal strip located on the rear of the cord pack. Tighten the screws fastening the terminal connector to the terminal strip, and tighten the mounting screws located on the front and the rear of the cord pack. (Refer to TM 11-2134, para 66, p 62.)

7. Perform the operational tests to identify all trouble symptoms, using the defective cord pack and at least two line or trunk circuits. (Refer to TM 11-4134, para 28c thru 28f, pp 23 thru 25.)

8. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 through 7 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
9. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 8. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
10. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
11. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-4134, w/C1 thru 3, Manual Telephone Switchboard SB-86/P; Field Maintenance, Sep 55.

TM 11-2134, w/C1 thru 5, Manual Telephone Switchboard SB-86/P; Installation and Operation, Sep 55.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 411, Local-Battery Telephone Switchboards.

TASK**113-594-0006**

Troubleshoot Operator's Telephone Circuit TA-220/P

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Operator's Telephone Circuit TA-220/P (operator's pack) from a Manual Telephone Switchboard SB-86/P with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Two Manual Telephone Switchboards SB-86/P, in operating condition.
4. Two Telephone Sets TA-312/PT (or equivalent telephones with both local battery and common battery signaling capabilities).
5. Tool Kit TE-49.
6. Test Set I-142-(*) (or equivalent test set).
7. Test Set TS-140/PCM (or equivalent test equipment).
8. Pen.
9. TM 11-4134.
10. TM 11-2134.
11. TM 38-750.

Supervision and assistance are available.

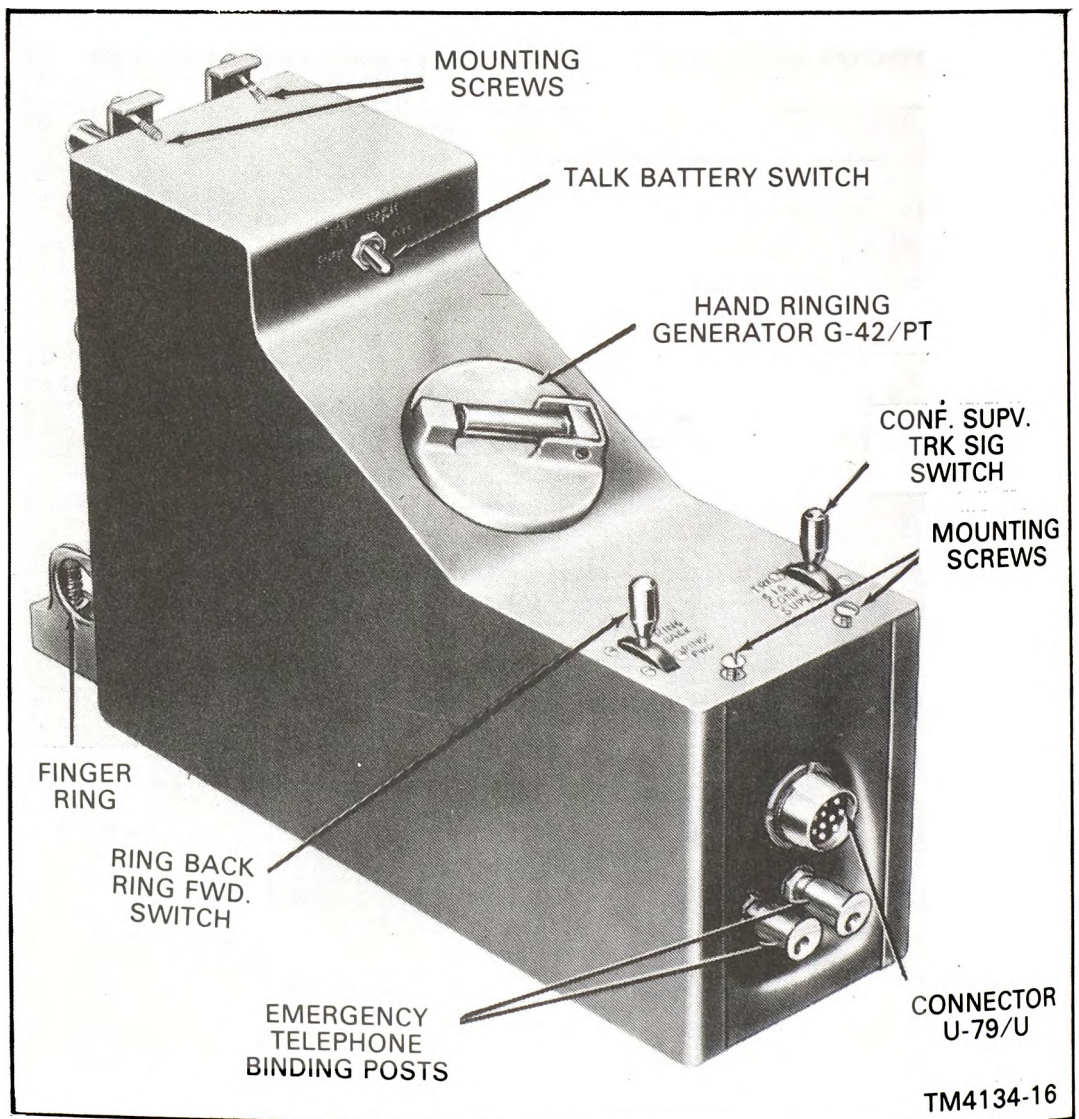


Figure 1. Operator's Telephone Circuit TA-220/P
(Operator's Pack)

STANDARDS

Task standard has been completed when the causes of the operator's telephone circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the screws and the cover of the operator's telephone circuit (operator's pack). (Refer to TM 11-4134, para 34a, p 37.)
4. Inspect the operator's telephone circuit for visible defects. (Refer to TM 11-4134, para 24a, p 19.)
5. Replace the cover and cover screws on the operator's pack.
6. Slide the operator's pack into its place in the keyshelf section of the switchboard while holding the terminal connector and the multiple cable to one side. (Refer to TM 11-2134, para 67b(1), pp 63 and 64.)

NOTE: When sliding the operator's pack into position, do not allow the operator's pack mounting screws to bind on the keyshelf section.

7. Fit the terminal connector onto the terminal strip located on the rear of the operator's pack. (Refer to TM 11-2134, para 67b(2), p 64.)
8. Tighten the screws fastening the terminal connector to the terminal strip, and tighten the mounting screws located on the front and the rear of the operator's pack. (Refer to TM 11-2134, para 67b(3), p 64.)
9. Perform the operational tests to identify all trouble symptoms, using at least two line or trunk circuits. (Refer to TM 11-4134, para 28c thru 28f, pp 23 thru 25.)

10. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 9 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
11. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 10. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
12. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
13. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-4134, w/C 1 thru 3, Manual Telephone Switchboard SB-86/P; Field Maintenance Sep 55.

TM 11-2134, w/C 1 thru 5, Manual Telephone Switchboard SB-86/P; Installation and Operation, Sep 55.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 411, Local-Battery Telephone Switchboards.

TASK**113-607-0006**

Troubleshoot Power Supply PP-990/G

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Power Supply PP-990/G with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Pen.
6. TM 11-4134.
7. TM 11-2134.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the power supply trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

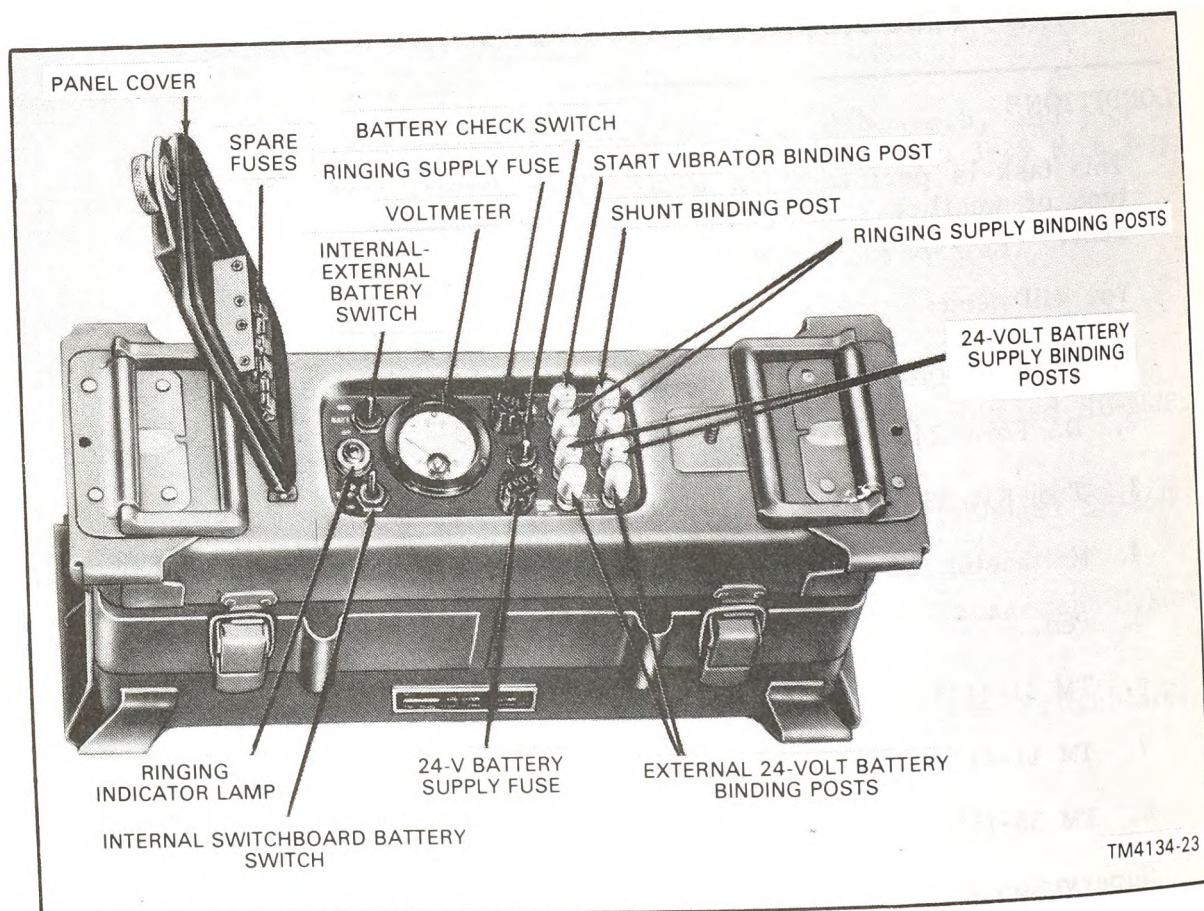


Figure 1. Power Supply PP-990/G.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Unlatch the four trunk-type latches on the sides of the power supply (power pack). Lift the chassis of the power supply from its case. (Refer to TM 11-4134, para 37a, p 42.)
4. Remove the batteries from the battery compartments. (Refer to TM 11-4134, para 37b, p 42; TM 11-2134, para 65a, p 61.)
5. Unscrew the two assembly screws from each end of the power supply chassis. Lift the top section from the power supply chassis.

(Refer to TM 11-4134, para 37c, p 42.)
6. Examine the power pack for visible defects. (Refer to TM 11-4134, para 24a, p 19.)
7. Replace the top section on the power supply chassis. Screw the assembly screws into each end of the power supply chassis.
8. Install batteries in the battery compartments of the power pack. (Refer to TM 11-2134, para 21, p 19.)
9. Connect power pack to Switchboard SB-86. (Refer to TM 11-2134, para 28 and 29, pp 27 thru 29.)
10. Perform the operational tests to identify all trouble symptoms. (Refer to TM 11-4134, para 28a thru 28b, pp 22 and 23.)
11. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 9 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
12. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in Step 10. (Refer to TM 11-4134, para 29, pp 25 thru 27.)
13. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

14. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-4134, w/C 1 thru 3, Manual Telephone Switchboard SB-86/P;
Field Maintenance, Sep 55.

TM 11-2134, w/C 1 thru 5, Manual Telephone Switchboard SB-86/P;
Installation and Operation, Sep 55.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System
(TAMMS), May 78.

ACCP Subcourse SSO 411, Local-Battery Telephone Switchboards.

TASK**113-574-2007**

Perform a Cord Pack Insertion Loss Test on Cord Telephone Circuit TA-208/P

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Repaired Cord Pack (Cord Telephone Circuit TA-208/P) installed in Manual Telephone Switchboard SB-86/P and accompanying DA Form 2407.
2. Test Set TS-140/PCM composed of Signal Generator SG-15(*) and Decibel Meter ME-22(*)/PCM (or equivalent).
3. DA Form 2404 for recording test results.
4. DA Form 2407 for recording required maintenance.
5. Two lengths of 2-conductor jumper wire.
6. Pen.
7. TM 11-4134.
8. TM 11-6625-251-15.
9. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the signal loss of the repaired cord pack has been measured and evaluated as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the equipment and materials listed under CONDITIONS.

NOTES: Testing of the cord pack requires the use of two serviceable switchboard line circuits.

Test set preliminary starting procedures, starting procedures and final adjustments are not included in this task but have to be completed before proceeding with this task. (Refer to TM 11-6625-251-15, para 3-12 thru 3-14, pp 3-6 and 3-7.)

During the test, the switches on the operator's pack will NOT be operated.

2. Perform cord pack insertion loss test. (Refer to TM 11-4134, para 50, p 48.)
3. Determine whether the cord pack requires further repair based on the following standard:

A loss of 1.5 decibel or less (an answer of 0 to -1.5) is acceptable. (Refer to TM 11-4134, para 50i, p 49.)
4. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) thru 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-4134, w/C 1 thru 3, Manual Telephone Switchboard SB-86/P
Field Maintenance, Sep 55.

TM 11-6625-251-15, w/C1, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Test Set, TS-140/PCM; Signal Generators SG-15/PCM and SG-15A/PCM and Decibel Meters ME-22/PCM and ME-22A/PCM, Jul 66.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-594-0009

Troubleshoot Manual Telephone Switchboard SB-249/TTC

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Manual Telephone Switchboard SB-249/TTC with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Tool Kit TE-73.
5. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent).
6. Test Set TS-190/U (or equivalent).
7. Test Set TS-26/TSM (or equivalent test set).
8. Pen.
9. TM 11-2146.
10. TM 38-750.

Supervision and assistance are available.

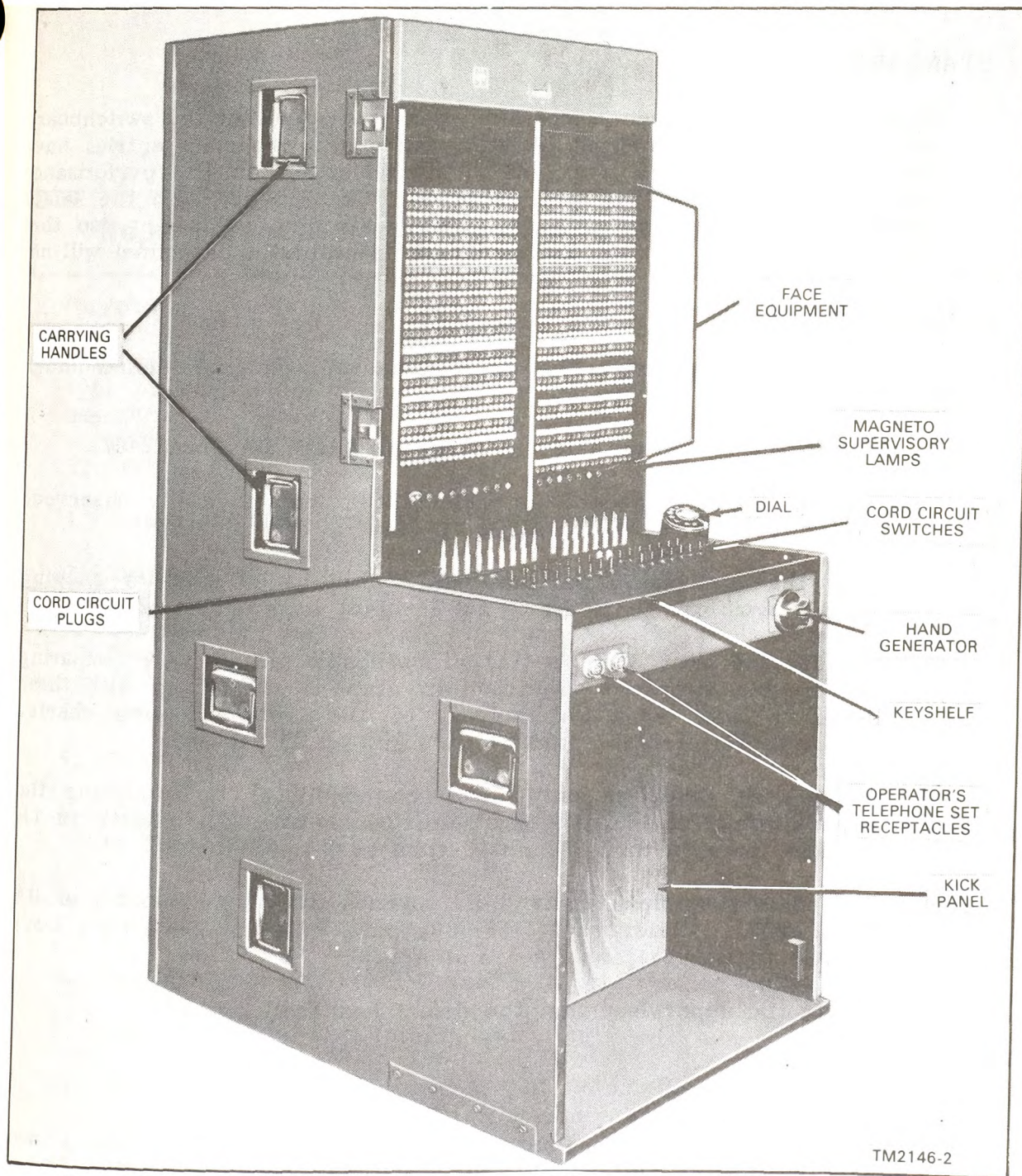


Figure 1. Manual Telephone Switchboard SB-249/TTC, Rear View

(Refer to task 113-594-0009, Troubleshoot Manual Telephone Switchboard SB-249/TTC, for a view of the front of the switchboard.)

STANDARDS

Task standard has been completed when the causes of the switchboard trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the switchboard for defects that can be easily observed. (Refer to TM 11-2146, para 83b, p 62.)
4. Test the component contacts and windings of circuits showing trouble symptoms. (Refer to TM 11-2146, para 82f, p 62.)
5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 through 4 with those listed in the "symptom" column of the troubleshooting charts. (Refer to TM 11-2146, para 84 thru 89, pp 63 thru 69.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2146, para 84 thru 90, pp 63 thru 69.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2146, w/C 1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-594-4009**

Repair Manual Telephone Switchboard SB-249/TTC

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Manual Telephone Switchboard SB-249/TTC.
2. DA Form 2407 with the switchboard defect(s) listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tool Kit TE-49.
5. Tool Kit TE-73.
6. Manual Telephone Central Office AN/TTC-7, special tools. (Refer to TM 11-2146, para 78, p 58.)
7. Manual Telephone Central Office AN/TTC-7, maintenance materials. (Refer to TM 11-2146, para 77a, p 57.)
8. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent.)
9. Test Set TS-26/TSM (or equivalent test set).
10. Test Set TS-140/PCM composed of Signal Generator SG-15(*), and Decibel Meter ME-22(*)/PCM, (or equivalent test set).
11. Telephone Test Set AN/PTM-6 (or Test Set I-142-(*)).
12. Multimeter AN/URM-105 (or equivalent multimeter).

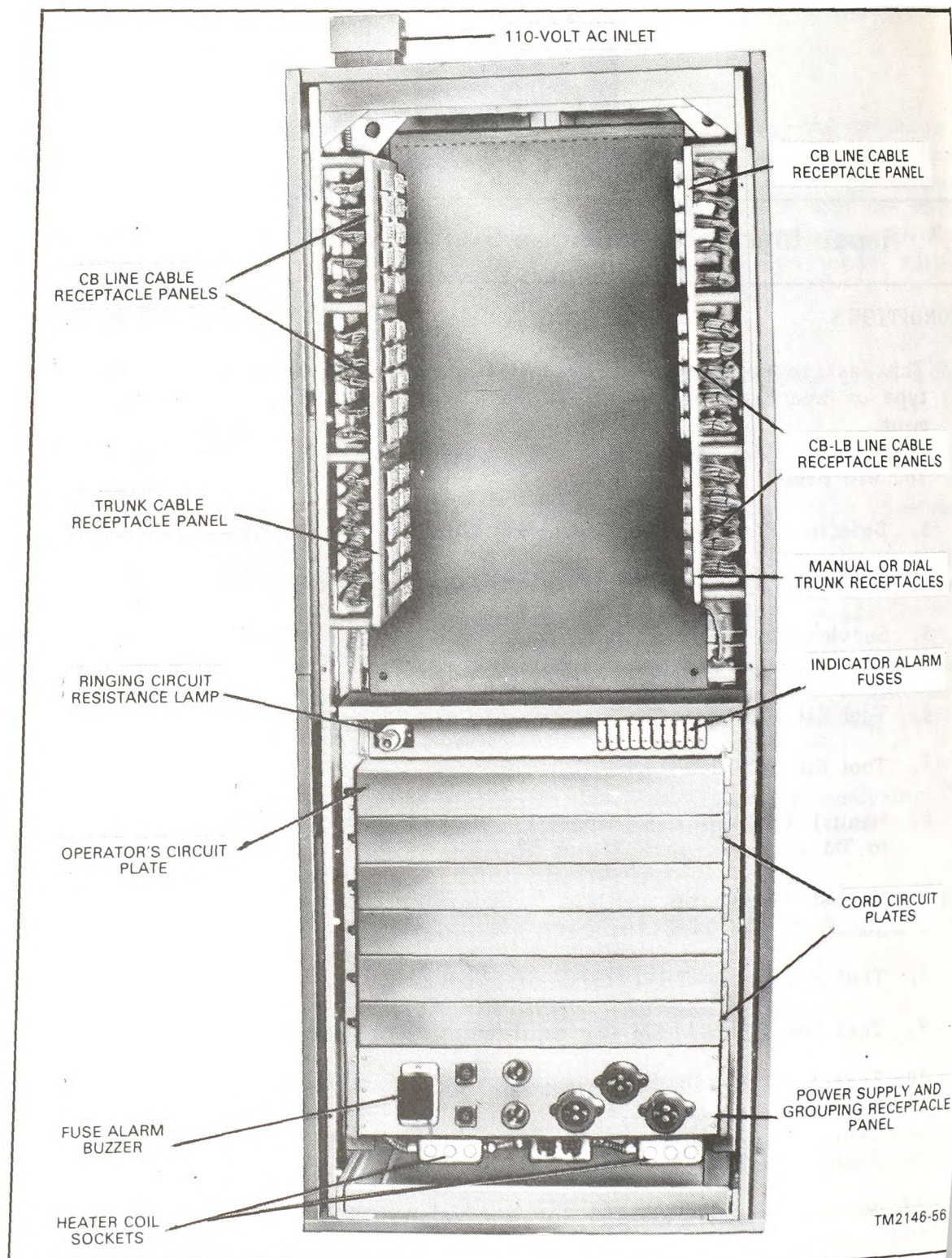


Figure 1. Manual Telephone Switchboard SB-249/TTC
(Refer to task 113-594-4009, Repair Manual Telephone Switchboard SB-249/TTC, for a rear view of the switchboard.)

13. Pen.
14. TM 11-2146.
15. TM 38-750.
16. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the switchboard defects have been corrected and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the defects listed in block 20 of the DA Form 2407.

NOTE: If possible, leave the switchboard in service while making repairs. In such cases, do not disturb the switchboard attendant.

3. Disassemble the switchboard to the extent required to make the repair(s). (Refer to TM 11-2146, para 104 thru 108, pp 83 thru 90.)
4. Unsolder the defective part(s) or component(s) (if the item(s) to be removed have soldered connections). (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
5. Replace, repair or adjust the defective part(s) or component(s), depending on the kind of defect(s) to be corrected. (Refer to TM 11-2146, para 104 thru 108, pp 83 thru 90.)
6. Solder any connections requiring soldering. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 71, pp 2 thru 16.)

7. Assemble the switchboard. (Refer to TM 11-2146, para 104 thru 108, pp 83 thru 90.)
8. Perform tests, from the following list, which apply to the circuit(s) that were repaired. (Refer to TM 11-2146, para 158 thru 165, pp 111 thru 118.)
 - a. Face equipment tests.
 - b. Cord circuit test.
 - c. Switchboard operational test. (Refer to task 113-594-0011, Perform a Switchboard Operational Test of Manual Telephone Switchboard SB-249/TTC.)
 - d. Dial circuit test.
 - e. Grouping circuit test.
 - f. Manual Telephone Switchboard SB-249/TTC Insertion Loss Tests.
 - g. Headset-Microphone H-91/U Tests.
 - h. Dial tests.
9. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
10. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2146, w/C1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0001**

**Troubleshoot Line Relay Telephone Circuit
TA-223/TTC**

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Line Relay Telephone Circuit TA-223/TTC with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Tool Kit TE-73.
5. Test Set TS-26/TSM (or equivalent test set).
6. Multimeter AN/URM-105 (or equivalent multimeter).
7. Test Set TS-190/U (or equivalent).
8. Pen.
9. TM 11-2146.
10. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the line relay telephone circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the line relay telephone circuit and associated units for defects that can be observed easily. (Refer to TM 11-2146, para 82a thru 82f, p 62; para 58g, p 48.)
4. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2146, para 84 and 85, pp 63 and 64.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-2146, para 84 and 85, pp 63 and 64; para 90b, p 69.)
6. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2146, w/C 1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0004**

**Troubleshoot Trunk Relay Telephone Circuit
TA-276/TTC**

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Trunk Relay Telephone Circuit TA-276/TTC with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Tool Kit TE-73.
5. Test Set TS-26/TSM (or equivalent test set).
6. Multimeter AN/URM-105 (or equivalent multimeter).
7. Test Set TS-190/U (or equivalent).
8. Pen.
9. TM 11-2146.
10. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the trunk relay telephone circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the trunk relay telephone circuit and associated units for defects that can be observed easily. (Refer to TM 11-2146, para 82a thru 82f, p 62; para 58g, p 48.)
4. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2146, para 87, pp 65 and 66.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-2146, para 87, pp 65 and 66.)
6. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2146, w/C 1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0005**

**Troubleshoot Telephone Main Distribution Frame
TA-257/TTC**

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Main Distribution Frame TA-257/TTC with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. Tool Kit TE-73.
5. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent).
6. Test Set TS-26/TSM (or equivalent test set).
7. Multimeter AN/URM-105 (or equivalent multimeter).
8. Pen.
9. TM 11-2146.
10. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the main distribution frame trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment so that the equipment will not be damaged and maintenance personnel will not be injured.

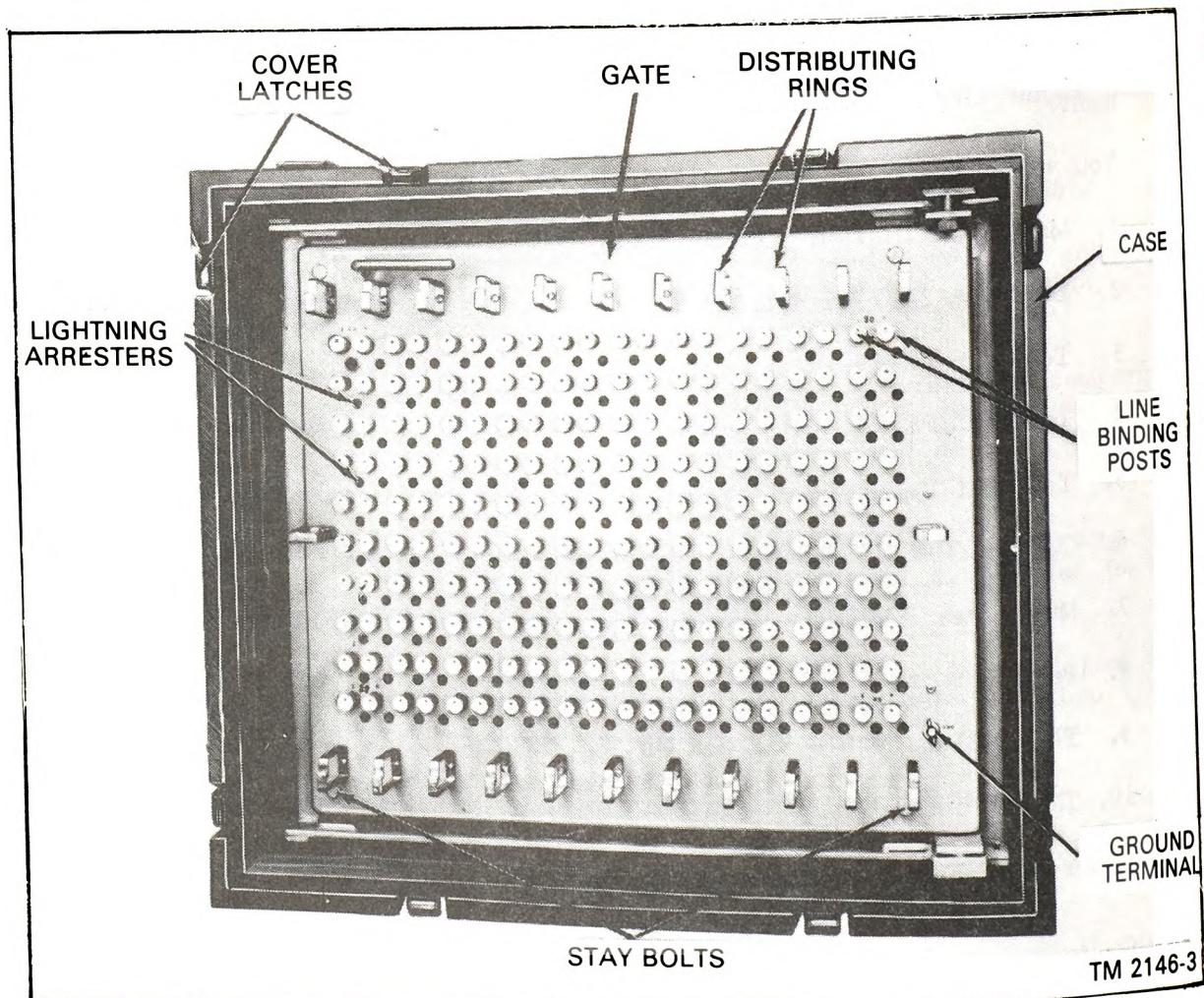


Figure 1. Telephone Main Distribution Frame TA-257/TTC, Line Side

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the main distribution frame for defects that can be easily observed. (Refer to TM 11-2146, para 82a thru 82d, and 83b, p 62.)
4. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2146, para 84 thru 86, pp 63 thru 65.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-2146, para 84 thru 86, pp 63 thru 65.)
6. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2146, w/C1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-594-0011

Perform a Switchboard Operational Test of Manual Telephone Switchboard SB-249/TTC

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Manual Telephone Switchboard SB-249/TTC, to be tested.
2. DA Form 2407 for recording test results.
3. DA Form 2407 for recording required maintenance actions.
4. Tool Kit TE-49.
5. Multimeter AN/URM-105 (or an equivalent multimeter or an ohmmeter or a buzzer).
6. Two Telephone Sets TA-312/PT (or equivalent field telephones capable of local battery and common battery operation) in operating condition.
7. Test cable.
8. Pen.
9. TM 11-2146.
10. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the operation of the switchboard has been tested and evaluated as described in the performance measures and the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2146, para 145, p 106.)
2. Perform switchboard operational test. (Refer to TM 11-2146, para 160, pp 113 and 114.)
3. Determine whether the switchboard requires further repair based on the standards of equipment performance. (Refer to TM 11-2146, para 160b, pp 113 and 114.)
4. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) thru 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-2146, w/C 1, 4, and 6 thru 12, Telephone Central Office Manual, AN/TTC-7 and AN/TTC-7A; Manual Telephone Central Office Group, AN/GTA-14(V), Jan 58.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 422, Mobile Multiple-Position Central Offices.

TASK

113-604-0014

Troubleshoot Panel BD-132

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Power Panel BD-132 with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Telephone central office equipment to which the panel can be connected for operation.
4. Tool Kit TE-49.
5. Tool Kit TE-112.
6. Spring scale.
7. Shunt instrument.
8. Adapter MX-1471/U.
9. Test Set Relay TS-1775/U (or test set I-181 or equivalent).
10. Multimeter AN/URM-105 (or equivalent multimeter).
11. Pen.
12. TM 11-2064.
10. TM 38-750.

Supervision and assistance are available.

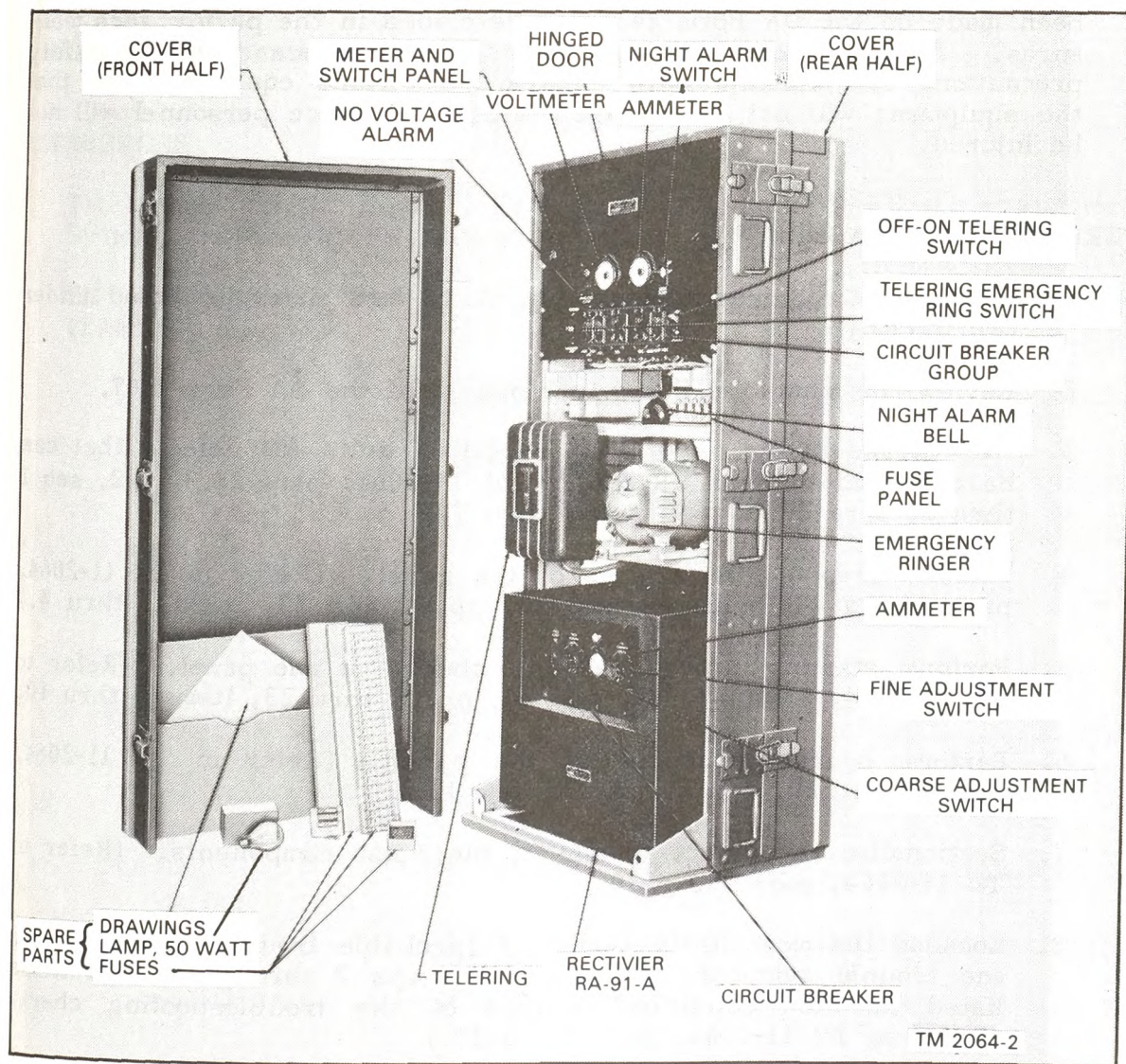


Figure 1. Panel BD-132

STANDARDS

Task standard has been completed when the causes of the power panel trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the power panel and associated units for defects that can be observed easily. (Refer to TM 11-2064, para 22.3, p 2, seq 2 thru 5; para 27.2, p 4, seq 1 thru 7.)
4. Perform preoperating checks of the panel. (Refer to TM 11-2064, para 16, p 21; para 19 and 20, pp 22 and 23, items 1 thru 4.)
5. Perform starting procedures and checks of the panel. (Refer to TM 11-2064, para 17, 19, and 20, pp 21 thru 23, items 5 thru 10.)
6. Perform operating checks of the panel. (Refer to TM 11-2064, para 19 and 20, pp 22 and 23, item 11.)
7. Sectionalize the defect to one of the major components. (Refer to TM 11-2064, para 31, p 30.)
8. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 through 6 with those listed in the "condition" column of the troubleshooting chart. (Refer to TM 11-2064, para 31, p 30.)
9. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 8. (Refer to TM 11-2064, para 31, p 30.)
10. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

11. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2064, w/C2 thru 7, Panels, BD-132 and BD-132-A, and Power Switchboard SB-361/TT, Jul 49

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-604-4015

Repair Panel BD-132

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Power Panel BD-132.
2. DA Form 2407 with the power panel defects listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tool Kit TE-49.
5. Tool Kit TE-112.
6. Multimeter AN/URM-105 (or equivalent multimeter).
7. Shunt instrument.
8. Adapter MX-1471/U.
9. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent test set).
10. Panel BD-132 maintenance materials.
11. Pen.
12. TM 11-2064.
13. TM 11-4302.
14. TM 38-750.

15. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the power panel have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS and TM 11-2064, para 72b, p 15.

2. Review the defects listed in column 20 of the DA Form 2407.

NOTE: If there is/are no part(s) or component(s) to be replaced on the cord connector panel, go to step 4.

3. Raise the hinged door located on the top front of the power panel. (Refer to TM 11-2064, para 79b(1), p 23.)

NOTES: If the adjustment of components is required, and the adjustment can be made without removing or disassembling components, go to step 10.

If no soldered connections are involved in the removal process, go to step 5.

4. Unsolder the connections. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71, para 55 thru 59, pp 2 thru 6.)

5. Remove the component(s) to be repaired from the panel. (Refer to TM 11-2064, para 40a, p 36.)

NOTE: If the component(s) is/are to be replaced (not repaired), go to step 8.

6. Disassemble the component(s) to the extent required to make the repairs on:
 - a. Teling. (TM 11-5805-298-15, para 4-5, p 15.)
 - b. Emergency ringer. (TM 11-2064, para 4le, p 36.)
 - c. Rectifier RA-91. (TM 11-6130-220-15.)
 7. Reassemble the component(s) by substituting serviceable parts for unserviceable ones and assembling the parts, beginning with the last part removed from the panel or panel component. (Refer to TM 11-2064, para 40b, p 36.)
 8. Replace the component(s) in their position(s) in the power panel. (Refer to TM 11-2064, para 40b, p 36.)
- NOTE: If the replacement of component(s) does not require the soldering of connections, go to step 10.)
9. Solder the connections. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 71, pp 2 thru 16.)
 10. Adjust the following panel components:
 - a. Relays. (Refer to TM 11-2064, para 41a, p 36; TM 11-4302, para 18 thru 21, pp 15 thru 24; para 39 and 40, pp 52 thru 59.)
 - b. Bells and buzzers. (Refer to TM 11-2064, para 41d, p 36; TM 11-4302, para 151 and 152, pp 148 thru 150.)
 - c. Emergency ringer. (Refer to TM 11-2064, para 4le, p 36.)
 - d. Switches. (Refer to TM 11-2064, para 41f, p 37.)
 11. Test the repaired components: (Refer to TM 11-2064, para 43a thru 43d, p 38.)
 12. Close the hinged door on the top front of the panel in the following manner: (Refer to TM 11-2064, para 79b(2), p 23.)
 - a. Pull up the supporting rods and lower the panel into place.
 - b. Tighten the two wingnuts on the hinged door.
 13. Record the required entries in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)

14. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2064, w/C 2 thru 7, Panels BD-132 and BD-132-A and Power Switchboard, SB-361/TT, Jul 49.

TM 11-4302, w/C1, Tactical Switchboards and Long Lines Equipment; Repair Instructions, Apparatus Requirements, Jul 46.

TM 11-5805-298-15, w/C1, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Generator, Ringing, Static, TA-248/TT and TA-248A/TT, Including Repair Parts and Special Tool Lists, Sep 65.

TM 11-6130-220-15, w/C1, Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Rectifiers RA-91, RA-91A, RA-91B, and RA-91C, Aug 68.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

TASK

113-604-0059

Troubleshoot Panel BD-132-A

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Power Panel BD-132-A with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Telephone central office equipment to which the panel can be connected for operation.
4. Tool Kit TE-49.
5. Tool Kit TE-112.
6. Spring scale.
7. Shunt instrument.
8. Adapter MX-1471/U.
9. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent).
10. Multimeter AN/URM-105 (or equivalent multimeter).
11. Pen.
12. TM 11-2064.
13. TM 38-750.

Supervision and assistance are available.

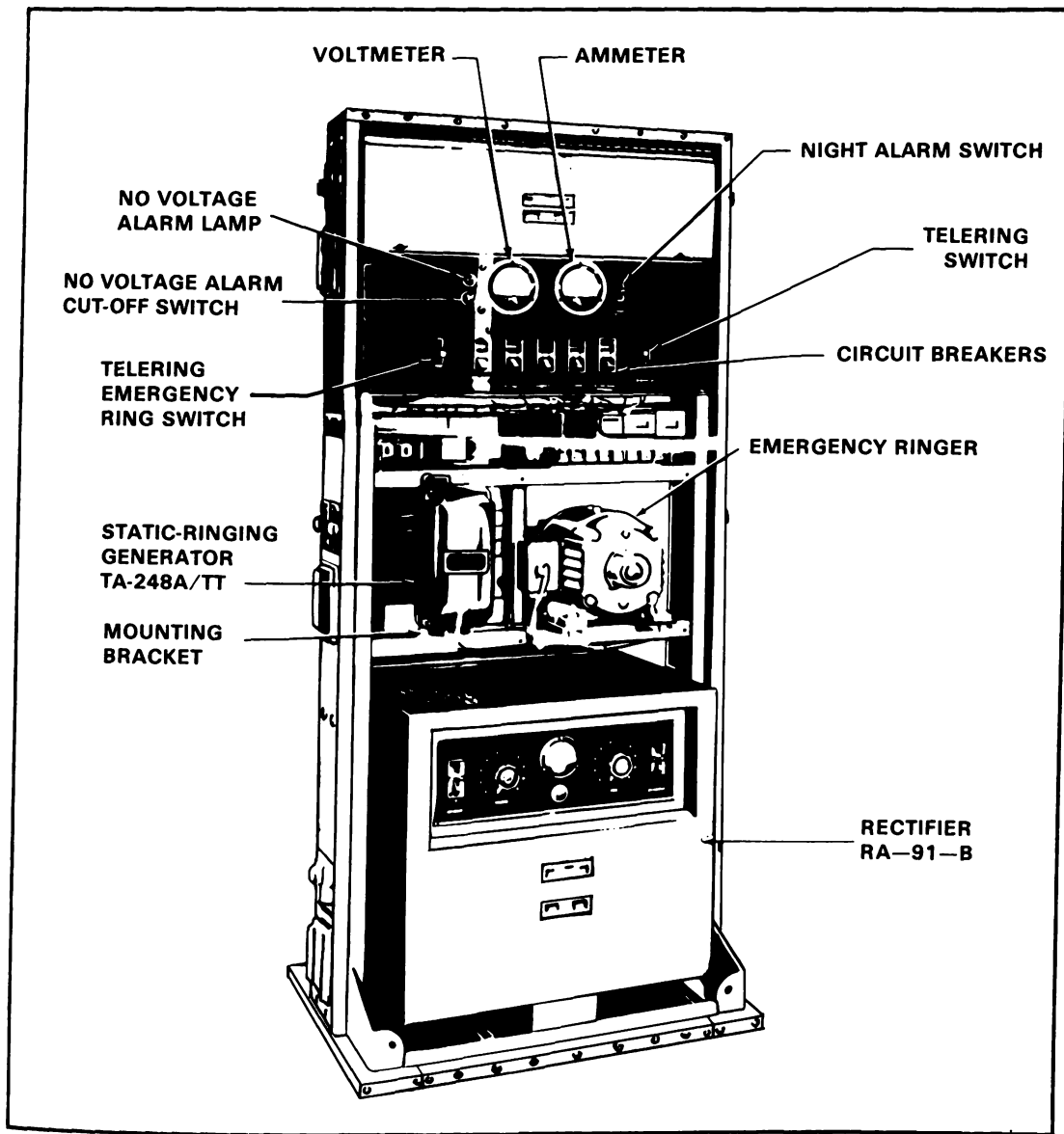


Figure 1. Typical Panel BD-132-A

STANDARDS

Task standard has been completed when the causes of the power panel trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the power panel and associated units for defects that can be observed easily. (Refer to TM 11-2064, para 22, p 2, seq 2 thru 5; para 27.2, p 4, seq 1 thru 7.)
4. Perform preoperating checks of the panel. (Refer to TM 11-2064, para 76, p 18, items 1 thru 5.)
5. Perform starting procedures and checks of the panel. (Refer to TM 11-2064, para 76, pp 18 and 19, items 6 thru 15.)
6. Perform operational checks of the panel. (Refer to TM 11-2064, para 76, p 19, items 16 and 17.)
7. Perform "stopping" procedures for the panel. (Refer to TM 11-2064, para 76, p 19, items 19 thru 23.)
8. Sectionalize the defect to one of the major components. (Refer to TM 11-2064, para 77, p 20.)
9. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 through 7 with those listed in the condition column of the troubleshooting chart. (Refer to TM 11-2064, para 78, pp 20 thru 23.)
10. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 9. (Refer to TM 11-2064, para 78, pp 20 thru 23.)

11. Record the entries required in columns 20b, e, g, h, and j, of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
12. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2064, w/C 2 thru 7, Panels, BD-132 and BD-132-A, and Power Switchboard SB-361/TT, Jul 49.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-604-4056

Repair Panel BD-132-A

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Power Panel BD-132-A.
2. DA Form 2407 with the power panel defects listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tool Kit TE-49.
5. Tool Kit TE-112.
6. Multimeter AN/URM-105 (or equivalent multimeter).
7. Shunt instrument.
8. Adapter MX-1471/U.
9. Test Set Relay TS-1775/U (or Test Set I-181 or equivalent test set).
10. Panel BD-132-A maintenance materials.
11. 110 volt ac power supply.
12. 48 volt battery bank (battery BB-46 or equivalent).
13. Pen.

14. TM 11-2064.

15. TM 11-4302.

16. TM 38-750.

17. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defects in the power panel have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2064, para 72b, p 15.)

2. Review the defects listed in column 20 of the DA Form 2407.

NOTE: If there is/are no part(s) or component(s) to be replaced on the cord connector panel, go to step 4.

3. Raise the hinged door located on the top front of the power panel. (Refer to TM 11-2064, para 79b(1), p 23.)

NOTE: If the adjustment of components is required, and the adjustment can be made without removing or disassembling components, go to step 10.

If no soldered connections are involved in the removal process, go to step 5.

4. Unsolder the connections. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6; TM 11-2064, para 79a, p 23.)

5. Remove the component(s) from the panel. (Refer to TM 11-2064, para 79, p 23.)

NOTE: If the component(s) is/are to be replaced (not repaired), go to step 8.

6. Disassemble the component(s) to the extent required to make the repair. (Refer to TM 11-2064, para 79 and 80a, p 23; para 82a, pp 27 and 28.)
7. Reassemble the component(s) by substituting serviceable parts for unserviceable ones and assembling the parts, beginning with the last part removed from the panel or panel component. (Refer to TM 11-2064, para 79a and 80b, pp 23 and 24; para 82b, pp 28 thru 31.)
8. Replace the component(s) in their position(s) in the power panel. (Refer to TM 11-2064, para 40b, p 36.)

NOTE: If the replacement of component(s) does not require the soldering of connections, go to step 10.

9. Solder the connections. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 71, pp 2 thru 16; TM 11-2064, para 79a, p 23.)
10. Adjust the following panel components:
 - a. Resistor R1. (Refer to TM 11-2064, para 81a, pp 24 and 25.)
 - b. Emergency ringer brush tension springs. (Refer to TM 11-2064, para 81b, p 25.)
 - c. Emergency ringer DC brush holder mounting ring assembly. (Refer to TM 11-2064, para 81c, pp 25 and 26.)
 - d. Switches. (Refer to TM 11-2064, para 81d, p 26; TM 11-4302, para 74 and 75, pp 107 thru 113.)
 - e. Bells and buzzers. (Refer to TM 11-2064, para 81d, p 26; TM 11-4302, para 162 and 163, pp 158 thru 160.)
 - f. Relays. (Refer to TM 11-2064, para 81d thru 81f, pp 26 and 27; TM 11-4302, para 39 and 40, pp 52 thru 59; para 49 and 50, pp 81 thru 86.)
11. Connect cord plug CD-393 to the IN 110V receptacle of the power panel. (Refer to TM 11-2064, para 83c(1), p 31.)

12. Connect the other end of cord plug CD-393 to a 110 volt ac power supply. (Refer to TM 11-2064, para 83c(1), p 31.)
13. Connect the BAT 48V and 24V receptacle to a 24-volt-tapped 48 volt battery bank. (Refer to TM 11-2064, para 83c(1), p 31.)
14. Start the power panel. (Refer to TM 11-2064, para 83c(2), p 31; para 67a and 67b, pp 4 thru 7.)

NOTE: Allow the batteries to charge for "a short period of time" before going on to step 15.

15. Test the repaired circuit(s). (Refer to TM 11-2064, para 83d thru 83f, pp 31 thru 35.)
16. Close the hinged door on the top front of the panel in the following manner: (Refer to TM 11-2064, para 79b(2), p 23.)
 - a. Pull up the supporting rods and lower the panel into place.
 - b. Tighten the two wingnuts on the hinged door.
17. Record the required entries in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
18. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2064, w/C 2 thru 7, Panels BD-132 and BD-132-A and Power Switchboard, SB-361/TT, Jul 49.

TM 11-4302, w/C1, Tactical Switchboards and Long Lines Equipment; Repair Instructions, Apparatus Requirements, Jul 46.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

TASK**113-607-0007**

Troubleshoot an RA-91 Series Rectifier

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Rectifier RA-91, RA-91A, RA-91B, or RA-91C with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TE-49.
4. 24-48 volt battery to be charged.
5. Source of 115 volt or 230 volt ac input power.
6. Multimeter TS-352B/U (or equivalent multimeter).
7. Pen.
8. TM 11-6130-220-15.
9. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the rectifier trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

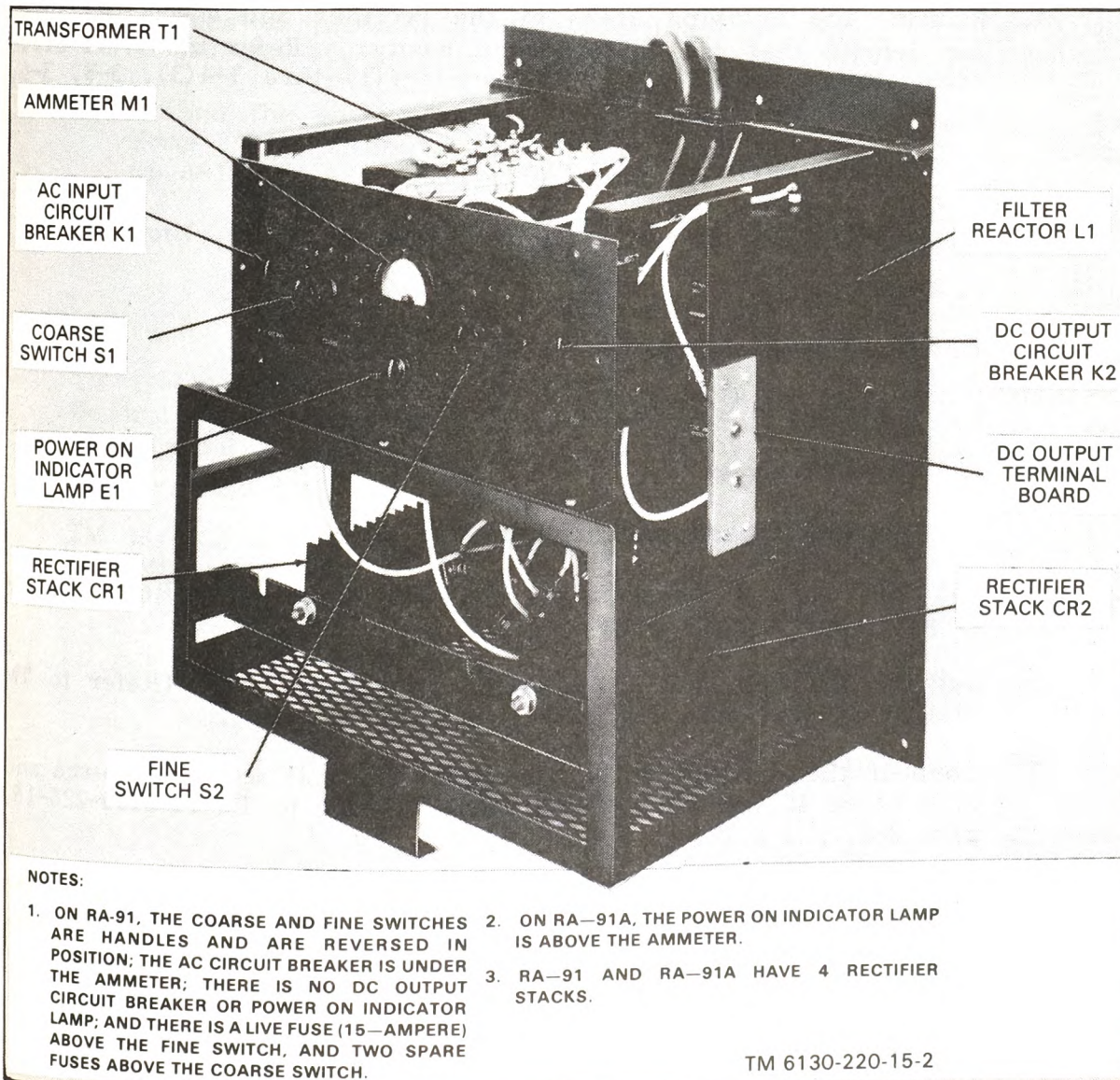


Figure 1. Rectifier RA-91, RA-91A, RA-91B or RA-91C (Cover Removed)

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the cover from the rectifier.
4. Examine the following areas of the rectifier and associated units for defects that can be observed easily: (Refer to TM 11-6130-220-15, para 5-2b(1), p 5-1; para 3-4(1) thru 3-4(3), 3-5, 3-6, pp 3-1 and 3-2.)
 - a. Exterior surfaces.
 - b. Connectors.
 - c. Cables.
 - d. Transformer terminals.
 - e. Gaskets and insulators.
 - f. Terminal block.
 - g. Interior (chassis and cabinet).
5. Set both circuit breakers at the OFF position. (Refer to TM 11-6130-220-15, para 2-3, p 2-3.)
6. Set the COARSE and FINE switches at position 1. (Refer to TM 11-6130-220-15, para 2-3, p 2-3.)
7. Connect the rectifier to a 115 volt or 230 volt ac input source and to a 24 or 48 volt battery (output). (Refer to TM 11-6130-220-15, para 2-3, p 2-3.)
8. Perform operational checks of the following functional areas of the rectifier. (Refer to TM 11-6130-220-15, para 5-2b(2), p 5-1; para 3-4(4) thru 3-4(7), pp 3-1 and 3-2.)
 - a. Controls and indicators.
 - b. Connections.

- c. AC input power and dc output power breaker switches.
9. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2, 4, and 8 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-6130-220-15, para 5-2a, 5-2b(3), 5-4, pp 5-1 and 5-2.)
10. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 9. (Refer to TM 11-6130-220-15, para 5-4, p 5-2.)
11. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
12. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-6130-220-15, w/C1, Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Rectifiers RA-91, RA-91A, RA-91B, and RA-91C, Aug 68.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-588-4013

Repair 26-Pair Cable CX-2584/U, CX-4560/U, CX-4566/G

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective 26-Pair Cable CX-2584/U, CX-4560/U, or CX-4566/G.
2. DA Form 2407 with the cable connector defects listed in block 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tool Kit TK-144/G or Tool Kit TE-123 (or an equivalent tool kit).
5. Multimeter TS-352B/U (or equivalent multimeter).
6. Pen.
7. TM 11-5805-204-14.
8. TM 11-5805-357-14-2
9. TM 11-6625-366-10, TM 11-6625-366-15, or applicable multimeter operator's manual.
10. TM 38-750.

Supervision and assistance are available.

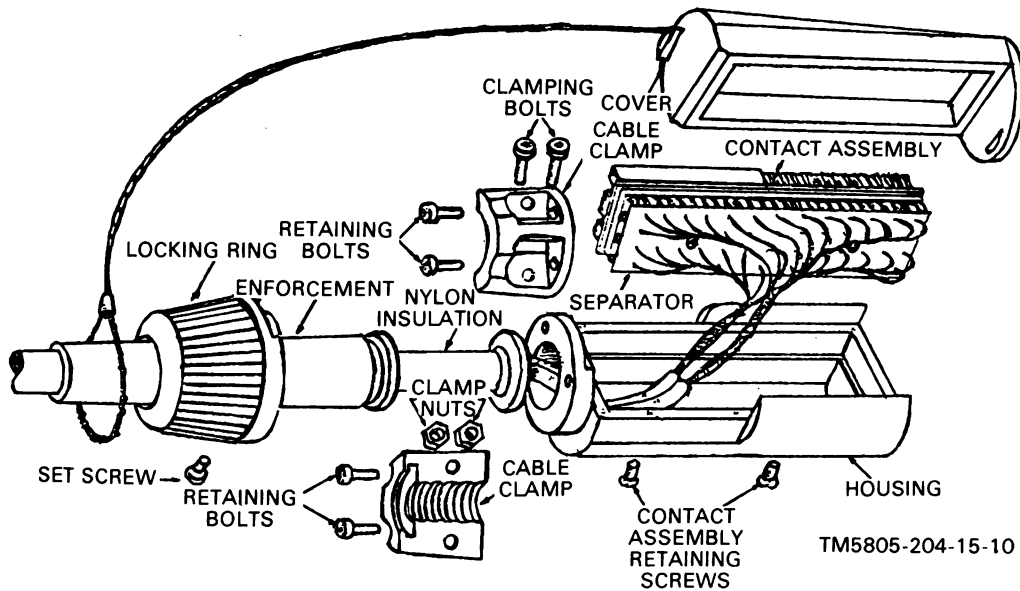


Figure 1. Twenty-Six Pair Cable Connector, Exploded View

STANDARDS

Task standard has been completed when the defect(s) in the cable connector have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the defects listed in column 20 of the DA Form 2407.

3. Disassemble the 26-pair cable connector to the extent required to make the repair. (Refer to TM 11-5805-357-14-2, para 7-5E, p-76, fig 7-6).
4. Remove enough insulation from the cable and individual leads to allow the installation of a connector.
5. Assemble the 26-pair connector on the cable. (Refer to TM 11-5805-357-14-2, para 7-5F, p 7-6 thru 7-9, fig 7-6).
6. Set up the multimeter for a resistance measurement. (Refer to TM 11-6625-366-15, para 2-9, p 2-7, or the applicable multimeter operator's manual.)
7. Connect the multimeter leads to corresponding contacts at each end of the cable.
8. Compare the test meter reading with the standard indication (0 ohms).
9. Perform steps 7 and 8 for each pair of contacts in the connectors.
10. Perform steps 3 through 9 as required until the cable meets the standards of equipment performance. (Refer to step 8.)
11. Install the cover on the connector. (Refer to TM 11- 5805-357-14-2, para 7-5F, p 7-8, fig 7-6).
12. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
13. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-5805-357-14-2, Operator's Organizational, Direct Support and General Support Maintenance Manual for Terminal Set, Telephone AN/TCC-61

TM 11-6625-366-10, Operator's Manual for Multimeter, TS-352B/U, Nov 76.

TM 11-6625-366-15, w/C 1 thru 3, Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Multimeter TS-352B/U, Jan 67.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-595-1001

Install Switchboard Telephone Automatic SB-3614(V)/TT

CONDITIONS

This task is performed in a tactical or nontactical environment under sheltered conditions and may be performed in an NBC situation.

You will need:

1. SB-3614(V)/TT.
2. TM 11-5805-695-12.
3. Wiring plan.

Supervision and assistance are available.

STANDARDS

Task standard has been met when you connect the ground, install terminal cards, connect power, terminate 30 lines without damage to the equipment, and submit a completion report to your team chief in accordance with performance measures 1 through 4 within 15 minutes.

PERFORMANCE MEASURES

1. Connect grounding device. (Refer to TM 11-5805-695-12, chap 2, sec IV, para 2-9, p 2-6.)
 - a. Drive ground rod in ground and connect ground strap.
 - b. Connect ground strap to the ground terminals on back of rear panel.
2. Connect power to SB-3614(V)/TT. (Refer to TM 11-5805-695-12, chap 2, sec IV, para 2-13, pp 2-8 and 2-9.)

NOTE: There are three different power connections on the back of the switchboards, only one connection is needed to provide power.

3. Make preliminary adjustments. (Refer to TM 11-5805-695-12, chap 2, sec V, para 3-3 and 3-4, p 3-7.)
 - a. Install headset.
 - b. Check fuse for proper value.
 - c. Turn POWER switch to ON.
 - d. Verify that 24 V dc power is available at input connectors.
4. Make test tone check on each line. (Refer to TM 11-5805-695-12, chap 3, sec II, para 3-5b, p 117.)
 - a. Depress call answer.
 - b. Key touch tone keys number N99.
 - c. Clear test tone by depressing CLEAR/CDRLS button.
 - d. Release by depressing OPR/RLSE button.
 - e. Submit completion report to your supervisor.

REFERENCES

TM 11-5805-695-12, Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT, Aug 77.

TASK

113-595-1004

Program SB-3614(V)/TT

CONDITIONS

This task is performed in a tactical or nontactical environment under all weather conditions and may be performed in an NBC environment.

You will need:

1. Preinstalled Operational SB-3614(V)/TT.
2. Program worksheet.

Supervision and assistance are available.

STANDARDS

Task standard has been met when information from the program worksheet has been entered, verified, deleted, and erased as outlined in performance measures 1 through 7.

PERFORMANCE MEASURES

1. Activate program toggle switch and erase all memory. (Refer to TM 11-5805-695-12, chap 2, sec II, para 2-4, p 2-5.)
2. Operate program call process switch to the program mode. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4, p 2-3.)
3. Enter data into computer via key sender using privilege assignment formats and program worksheet. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4c, p 2-3, table 2-2.)
4. Verify data previously entered. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4c, p 2-4.)
5. Delete intercept previously entered. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4d, p 2-4.)

6. Erase unneeded data previously entered. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4e, pp 2-4 and 2-5.)
7. Activate program toggle switch and erase all memory. (Refer to TM 11-5805-695-12, chap 2, sec I, para 2-4d, p 2-3, table 2-2.)

REFERENCES

TM 11-5805-695-12, Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT, Aug 77.

TASK

113-595-2001

Operate Switchboard Telephone Automatic SB-3614(V)/TT

CONDITIONS

This task is performed in a tactical or nontactical environment under all weather conditions and may be performed in an NBC situation.

You will need:

1. SB-3614(V)/TT.
2. TM 11-5805-695-12.

Supervision and assistance are available.

STANDARDS

Task standard has been met when one precedence call has been extended, a preemption has been made, all test tone checks have been performed and a standby and stop has been made in accordance with performance measures 1 through 3 within 15 minutes.

PERFORMANCE MEASURES

1. Perform a precedence and preemption. (Refer to TM 11-5805-695-12, chap 3, sec II, para 3-5b(8), p 3-10.)
 - a. Push CALL ANS button.
 - b. Key precedence before number. (Preemption has been completed when operator depresses key precedence number.)
2. Perform test tone checks. (Refer to TM 11-5805-695-12, chap 3, sec II, para 3-5b(14), p 3-12.)
 - a. Push CALL ANS button.

- b. Key N99 for test tone.
 - c. Depress CLEAR/CDRLS button when test tone is no longer needed.
 - d. Push OPR RLSE button to release circuit.
3. Perform standby and stop procedures. (Refer to TM 11-5805-695-12, chap 3, sec II, para 3-5(d), p 3-13.)
- a. Depress OPR RLSE button (standby).
 - b. Turn power ON/OFF switch to OFF. (Stop.)

REFERENCES

TM 11-5805-695-12, Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT, Aug 77.

TASK

113-595-0019

Direct Support Troubleshooting of Switchboard Automatic SB-3614(V)/TT

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Switchboard Assembly SB-3614 with suspected malfunction.
2. DA Form 2407 with switchboard trouble symptoms listed in block 16.
3. Tool Kit AN/USM-15.
4. Multimeter, Digital AN/USM-341 (or equivalent multimeter).
5. PCB extractor/insertter.
6. Oscilloscope AN/USM-338 (or equivalent oscilloscope).
7. Multimeter AN/USM-223 (or equivalent multimeter).
8. TM 11-5805-695-34.
9. TM 11-5805-695-12.
10. TM 38-750.
11. Pen.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the switchboard trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the switchboard for defects that can be easily observed. (Refer to TM 11-5805-695-34, para 3-5, p 3-121.)
4. Perform troubleshooting procedures and continuity tests of malfunctioning components. (Refer to TM 11-5805-695-34, para 3-6 and 3-7, pp 3-121 thru 3-126.)
5. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2, 3, and 4 with those listed in the "malfunction" column of the troubleshooting charts.
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable cause identified in step 5.
7. Record the entries required in blocks 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-695-12, Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT, Aug 77.

TM 11-5805-695-34, Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3014(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT, Aug 78.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-595-4020**

**Direct Support Repair of Switchboard
Automatic SC-3614(V)/TT**

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective Switchboard Assembly SB-3614/TT.
2. DA Form 2407 with the switchboard defect(s) listed in block 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Tool Kit AN/USM-15 (or equivalent).
5. Multimeter, Digital AN/USM-341 (or equivalent multimeter).
6. Oscilloscope AN/USM-338 (or equivalent oscilloscope).
7. PCB extractor/insertter.
8. Multimeter AN/USM-223 (or equivalent multimeter).
9. Pen.
10. TM 11-5805-695-34.
11. TM 11-5805-695-12.
12. TM 38-750.
13. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the switchboard defects have been corrected and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the defects listed in block 20 of the DA Form 2407.
3. Disassemble the switchboard to the extent required to make the repair(s). (Refer to TM 11-5805-695-34, para 3-8 thru 3-28, pp 3-126 thru 3-131.)
4. Unsolder the defective part(s) or component(s) (if the item(s) to be removed have soldered connections). (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
5. Replace, or repair the defective part(s) or component(s), depending on the kind of defect(s) to be corrected. (Refer to TM 11-5805-695-34, para 3-10 thru 3-28, pp 3-126 thru 3-131.)
6. Solder any connections requiring soldering. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 71, pp 2 thru 16.)
7. Assemble the switchboard. (Refer to TM 11-5805-695-34, para 3-10 thru 3-28, pp 3-126 thru 3-131.)
8. Perform tests which apply to the circuit(s) that were repaired. (Refer to TM 11-5805-695-34, para 3-29 thru 3-33, p 3-131.)
9. Perform steps 3 through 8 until the switchboard meets the test standards of equipment performance. (Refer to step 8.)
10. Record the entries required in blocks 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)

11. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-5805-695-12, Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT, Aug 77.

TM 11-5805-695-34, Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3614(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT, Aug 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-596-0016**

General Support Troubleshooting of Switchboard Automatic SB-3614(V)/TT Power Supply Module

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Power Supply Module Switchboard Automatic SB-3614(V)/TT with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit AN/USM-15.
4. Power supply module test fixture.
5. Digital Multimeter AN/USM-341.
6. (2) Power Supplies HP-6291A.
7. (2) W1 Power Cables (para 4-31).
8. 4.8-ohm, 10-watt load resistor.
9. 1.4-ohm, 20-watt load resistor.
10. 32-ohm, 5-watt load resistor.
11. 15-ohm, 10-watt load resistor.
12. 1.2-ohm, 1-watt load resistor.
13. 11.4-ohm, 10-watt load resistor.

14. 500-ohm, 20-watt load resistor.
15. 2.7-ohm, 10-watt load resistor.
16. 65-ohm, 2-watt load resistor.
17. 31-ohm, 5-watt load resistor.
18. 2.4K ohm, 2-watt load resistor.
19. 23-ohm, 5-watt load resistor.
20. 1.8-ohm, 10-watt load resistor.
21. 23-ohm, 2-watt load resistor.
22. 1.2K ohm, 1-watt load resistor.
23. 5K ohm, 5-watt load resistor.
24. 14-ohm, 5-watt load resistor.
25. 1.8-ohm, 15-watt load resistor.
26. 45-ohm, 5-watt load resistor.
27. 15-ohm, 10-watt load resistor.
28. 1.2K ohm, 1-watt load resistor.
29. 42-ohm, 5-watt load resistor.
30. 5K ohm, 5-watt load resistor.
31. 10-ohm, 2-watt load resistor.
32. Oscilloscope AN/USM-338.
33. Pen.
34. TM 11-5805-695-34.
35. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the power supply module trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Test and inspect the power supply module. (Refer to TM 11-5805-695-34, para 4-8, p 4-21; para 4-51 thru 4-59, pp 4-154 thru 4-176.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in step 3 with those listed in the malfunction column of the troubleshooting charts. (Refer to TM 11-5805-695-34, pp 4-22 thru 4-26, table 4-5.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable cause identified in step 4. (Refer to TM 11-5805-695-34, pp 4-22 thru 4-26, table 4-5.)
6. Record the entries required in blocks 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-695-34, Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3614(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT, Aug 78.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-595-0020

General Support Troubleshooting of Switchboard Automatic SB-3614(V)/TT PC Cards

TIONS

is task is performed in a tactical or nontactical situation under any
pe of weather conditions; it may be performed in an NBC environ-
nt.

u will need:

PC Card from Switchboard SB-3614(V)/TT with suspected mal-
function.

DA Form 2407 with PC card trouble symptoms listed in block 16.

Tool Kit AN/USM-15.

PCB test adapter.

4-Power Supplies HP-6291A.

Digital Multimeter AN/USM-341 (or equivalent).

Function Generator Wave TEK-110.

Oscilloscope AN/USM-338 (or equivalent).

600 ohm load resistor.

Pen.

TM 11-5805-695-34.

TM 38-750.

oervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the PC card trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Bench test PC card. (Refer to TM 11-5805-695-34, para 4-12 thru 4-15, pp 4-63 thru 4-72; para 4-60 thru 4-63, pp 4-177 thru 4-213.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "malfunction" column of the troubleshooting chart. (Refer to TM 11-5805-695-34, para 4-64, pp 4-63, table 4-7; pp 4-65 thru 4-68, table 4-8; pp 4-68 thru 4-72, table 4-9; pp 4-72 and 4-73, table 4-10.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable cause identified in step 4. (Refer to TM 11-5805-695-34, pp 4-63 and 4-64, table 4-7; pp 4-65 thru 4-68, table 4-8; pp 4-68 thru 4-72, table 4-9; pp 4-72 and 4-73, table 4-10.)
6. Record the entries required in blocks 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located. (Refer to the local SOP.)

REFERENCES

TM 11-5805-695-34, Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3614(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT, Aug 78.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-595-4021

Replacement of Components on PC Boards of Switchboard Automatic SB-3614(V)/TT

CONDITIONS

This task is performed in a tactical or nontactical situation under any type of weather conditions; it may be performed in an NBC environment.

You will need:

1. Defective PC board from SB-3614(V)/TT.
2. DA Form 2407 with the PC board defect listed in block 20.
3. Serviceable part(s) to replace the defective item(s).
4. Tool Kit AN/USM-15 (or equivalent).
5. Maintenance Kit, Electronic Equipment, PRC-350-CM (or equivalent).
6. Pen.
7. TM 11-5805-695-34.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the defective part(s) have been replaced and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the defect(s) listed in block 20 of the DA Form 2407.
3. Remove the defective part from the PC board. (Refer to TM 11-5805-695-34, para 4-21(1) thru 4-21(5), pp 4-76 and 4-77.)
4. Replace defective component. (Refer to TM 11-5805-695-34, para 4-21(6) thru 4-21(12), p 4-77.)
5. Record the entries required in blocks 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
6. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-5805-695-34, Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3614(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT, Aug 78.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

DIAL CENTRAL OFFICE REPAIRER

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TASK

113-604-0017

Troubleshoot Step-by-Step Dial Central Office Group Relay

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office group relay with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Step-by-step dial central office special tools.
4. Current-flow test set.
5. Pen.
6. TM 11-2103.
7. TM 11-2104.
8. TM 11-2111.
9. TM 38-750.
10. Manufacturer's schematic and wiring diagrams.
11. Manufacturer's relay adjustment sheets.

Supervision and assistance are available.

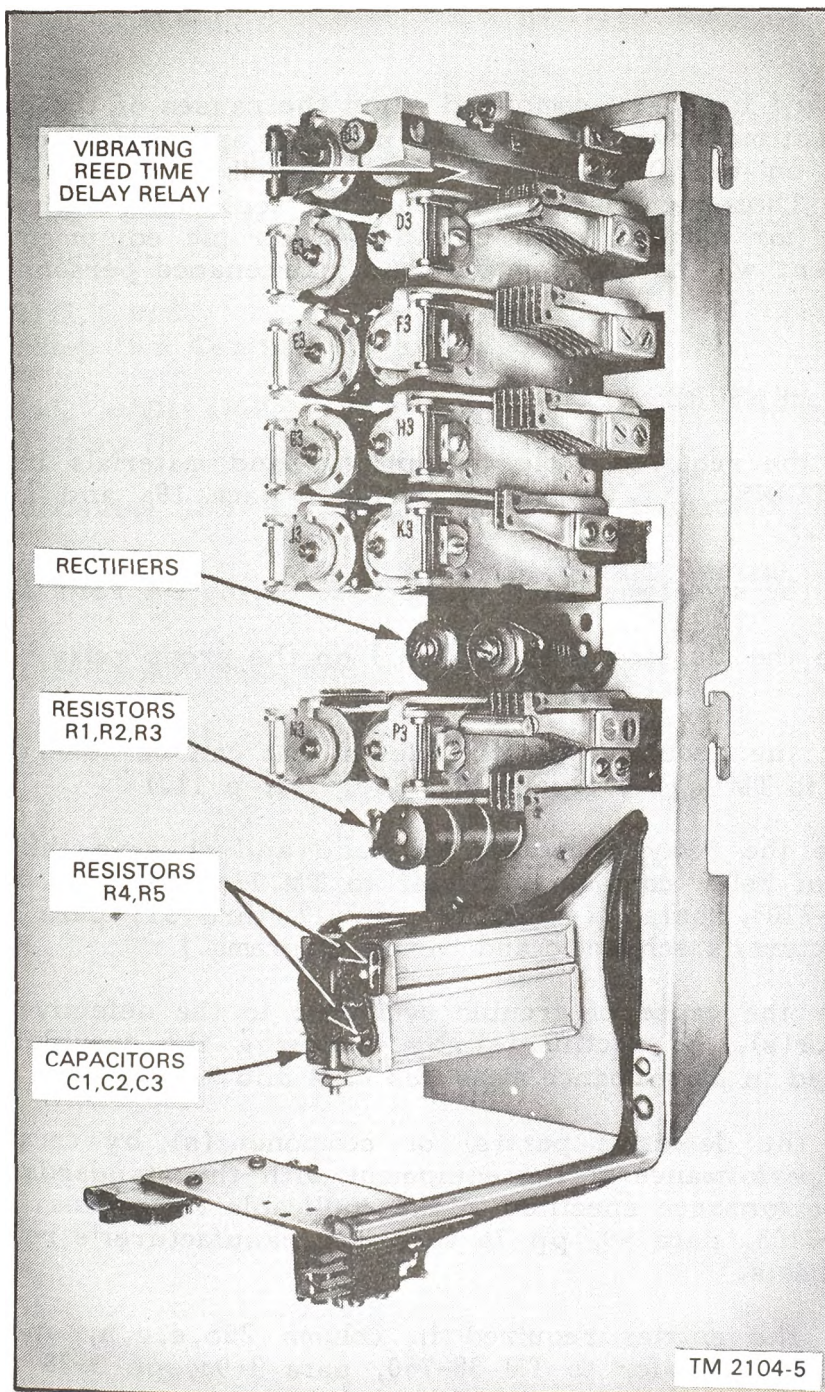


Figure 1. Step-by-Step Dial Central Office Group Relay Assembly.

STANDARDS

Task standard has been completed when the causes of the group relay trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a and 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the Busying Switch (SW-7) on the group relay. (Refer to fig 1.)
4. Inspect the group relay for defects that can be observed easily. (Refer to TM 11-2103, para 18c, 18d, 18f, p 11.)
5. Operate the relay armatures by hand and observe the make and break of relay contacts. (Refer to TM 11-2103, para 18e, p 11; TM 11-2104, para 21 thru 24, pp 17 thru 31; para 38, p 50; manufacturer's schematic and wiring diagrams.)
6. Localize the cause of trouble symptoms to the defective relay(s), capacitor(s), or rectifier(s) by analyzing the trouble symptoms identified in performance measures 2, 4 and 5.
7. Isolate the defective part(s) or component(s) by comparing the actual performance of the equipment with the standards of equipment performance specified in the applicable references. (Refer to TM 11-2103, para 59, pp 76 thru 85; manufacturer's relay adjustment sheets.)
8. Record the entries required in column 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; tables A-1 and A-2, pp A-1 thru A-6.)
9. Notify the supervisor that the defect has been located.

ENCES

11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step
al Central Office Equipment, Jun 50.

11-2104, w/C1, Linefinder Equipment Step-by-Step Dial Central
Office Equipment, May 50.

11-2111, w/C1, Tools Testing Equipment and Common Supplies
ep-by-Step Dial Central Office Equipment, May 50.

38-750, w/C1 and 2, The Army Maintenance Management System
(AMMS), May 78.

CP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

CP Subcourse SSO 416, Step-by-Step Dial Central Office Mainte-
nce.

manufacturer's schematic and wiring diagrams.

manufacturer's relay adjustment sheets.

TASK

113-604-0020

Troubleshoot Step-by-Step Dial Central Office Linefinder Switch

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office linefinder switch with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Step-by-step dial central office special tools.
4. Hand test telephone.
5. Pen.
6. TM 11-2103.
7. TM 11-2104.
8. TM 11-2111.
9. TM 38-750.
10. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

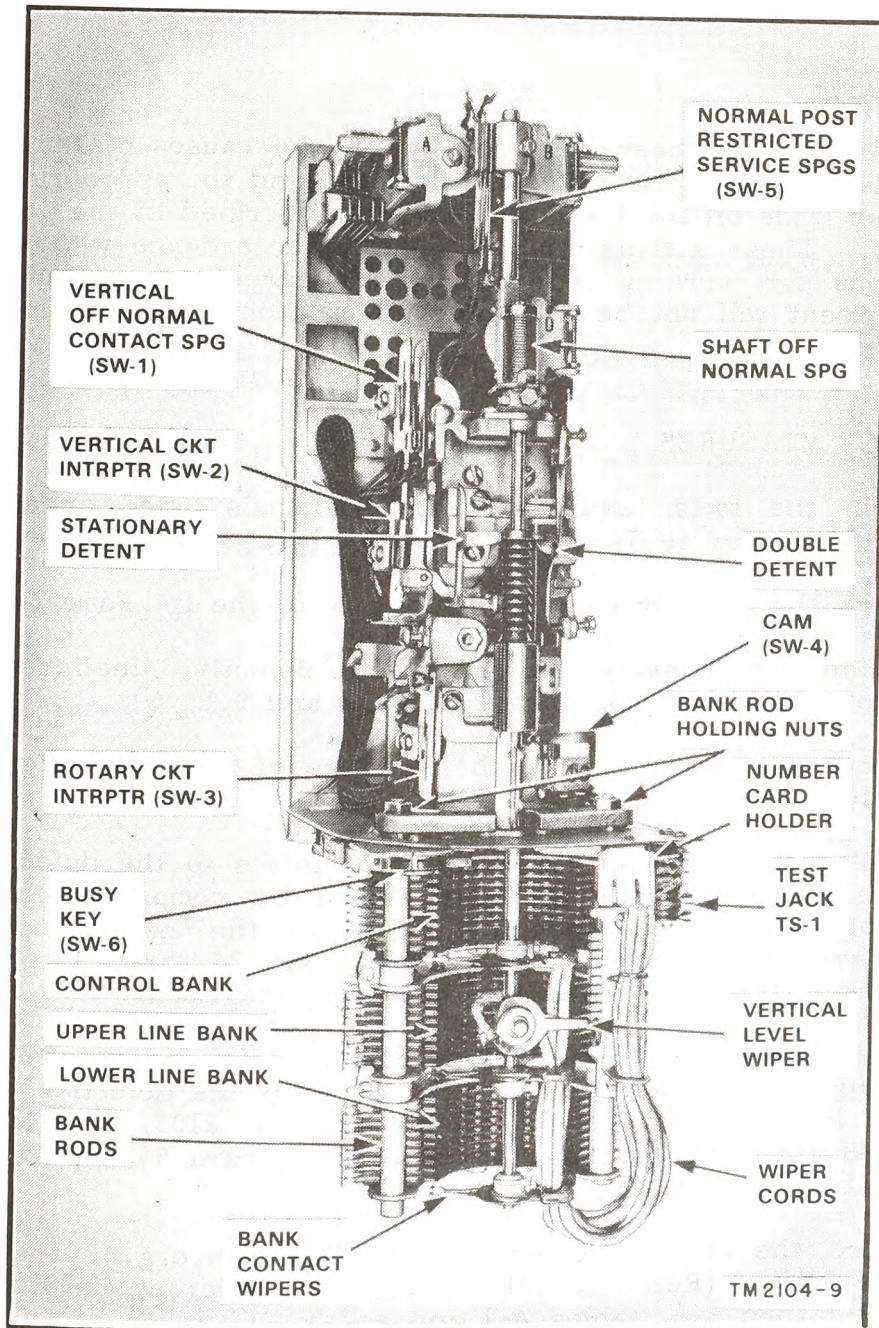


Figure 1. Step-by-Step Dial Central Office 200-Point Linefinder.

STANDARDS

Task standard has been completed when the causes of the linefinder switch trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a and 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the busying switch of the defective linefinder switch. (Refer to TM 11-2103, para 13b, pp 8 and 9.)
4. Inspect the linefinder switch for signs of defects. (Refer to TM 11-2103, para 13, pp 8 and 9.)
5. Localize the cause of the trouble symptoms to the defective major subassembly of the linefinder switch by comparing the trouble symptoms identified in steps 2 and 4 with the "normal" operation of the switch. (Refer to TM 11-2104, para 21 thru 29, pp 17 thru 33; manufacturer's schematic and wiring diagrams.)
6. Isolate the defective part(s) or component(s) by examining and/or testing the various items which make up the defective subassemblies identified in step 5. (Refer to TM 11-2103, para 48 thru 50, pp 48 thru 59; para 55, pp 69 and 70; para 59, pp 76 thru 85; TM 11-2103, para 48, pp 7 thru 11.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2104, w/C1, Linefinder Equipment Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

Manufacturer's schematic and wiring diagrams.

TASK

113-604-0018

Troubleshoot Step-by-Step Dial Central Office Reverting-Call Switch

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office reverting-call switch with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Step-by-step dial central office special tools.
4. Test telephone.
5. Pen.
6. TM 11-2106.
7. TM 11-2111.
8. TM 38-750.
9. An assistant to control the test telephone.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the reverting-call switch trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment,

that the equipment will not be damaged and maintenance personnel will not be injured.

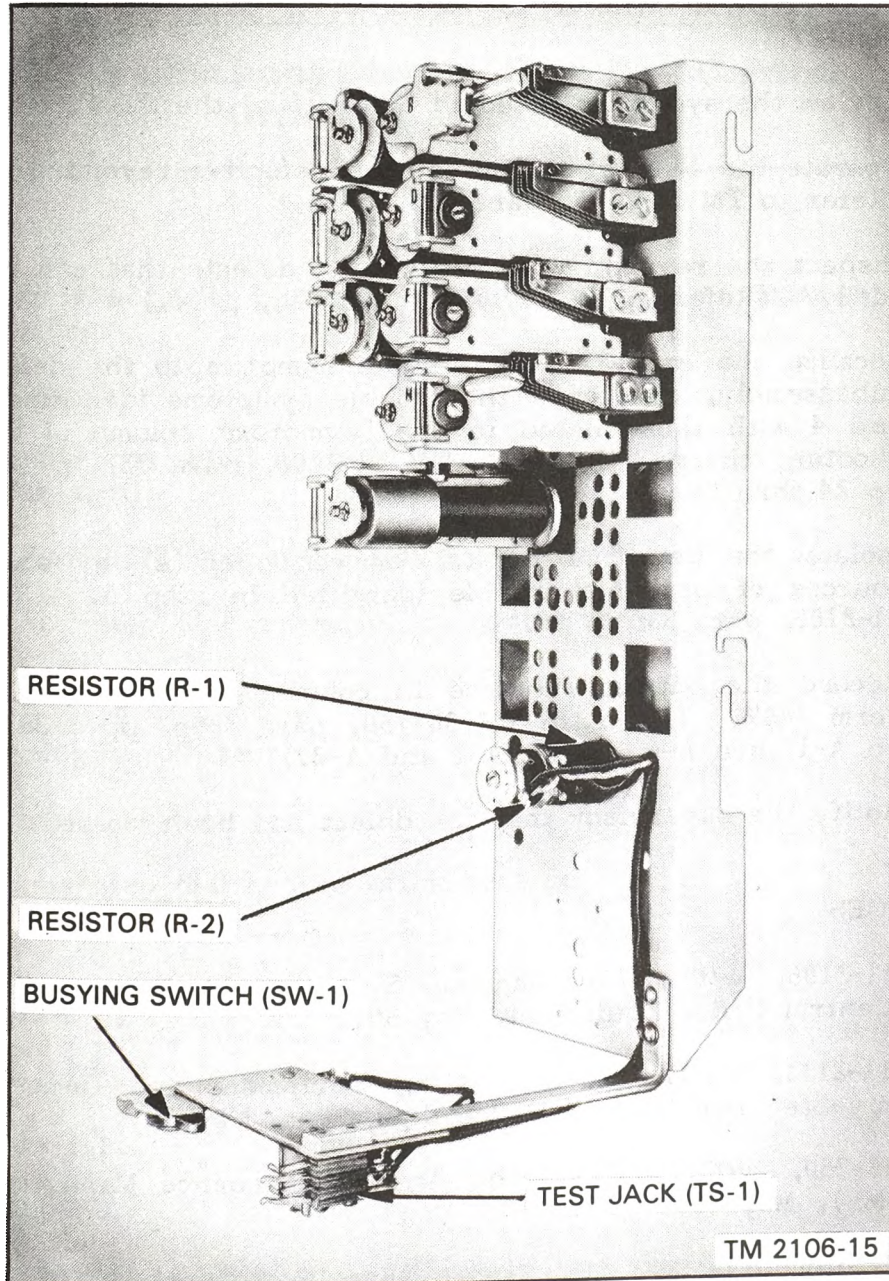


Figure 1. Step-by-Step Dial Central Office Reverting-Call Switch.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a thru 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the busying switch of the defective reverting-call switch. (Refer to TM 11-2106, para 31b, p 57.)
4. Inspect the reverting-call switch for defects that can be observed easily. (Refer to TM 11-2106, para 32b, p 57.)
5. Localize the cause of the trouble symptom to the defective major subassembly, comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the trouble-shooting chart. (Refer to TM 11-2106, para 33f, p 60; para 23, pp 24 thru 26.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2106, para 33f, p 60.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2106, w/C1, Miscellaneous Switching Equipment: Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

TASK**113-604-0021**

**Troubleshoot Step-by-Step Dial Central
Office Selector Switch**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

- . Step-by-step dial central office selector switch with suspected malfunction.
- . DA Form 2407 with trouble symptoms listed in block 16.
- . Step-by-step dial central office special tools.
- . Hand test telephone.
- . Stepping-switch test set.
- . Current-flow test set.
- . Step-by-step dial central office test desk.
- . Pen.
- . TM 11-2103.
- . TM 11-2105.
- . TM 11-2111.
- . TM 38-750.

Manufacturer's schematic and wiring diagrams (with installed wiring options marked).

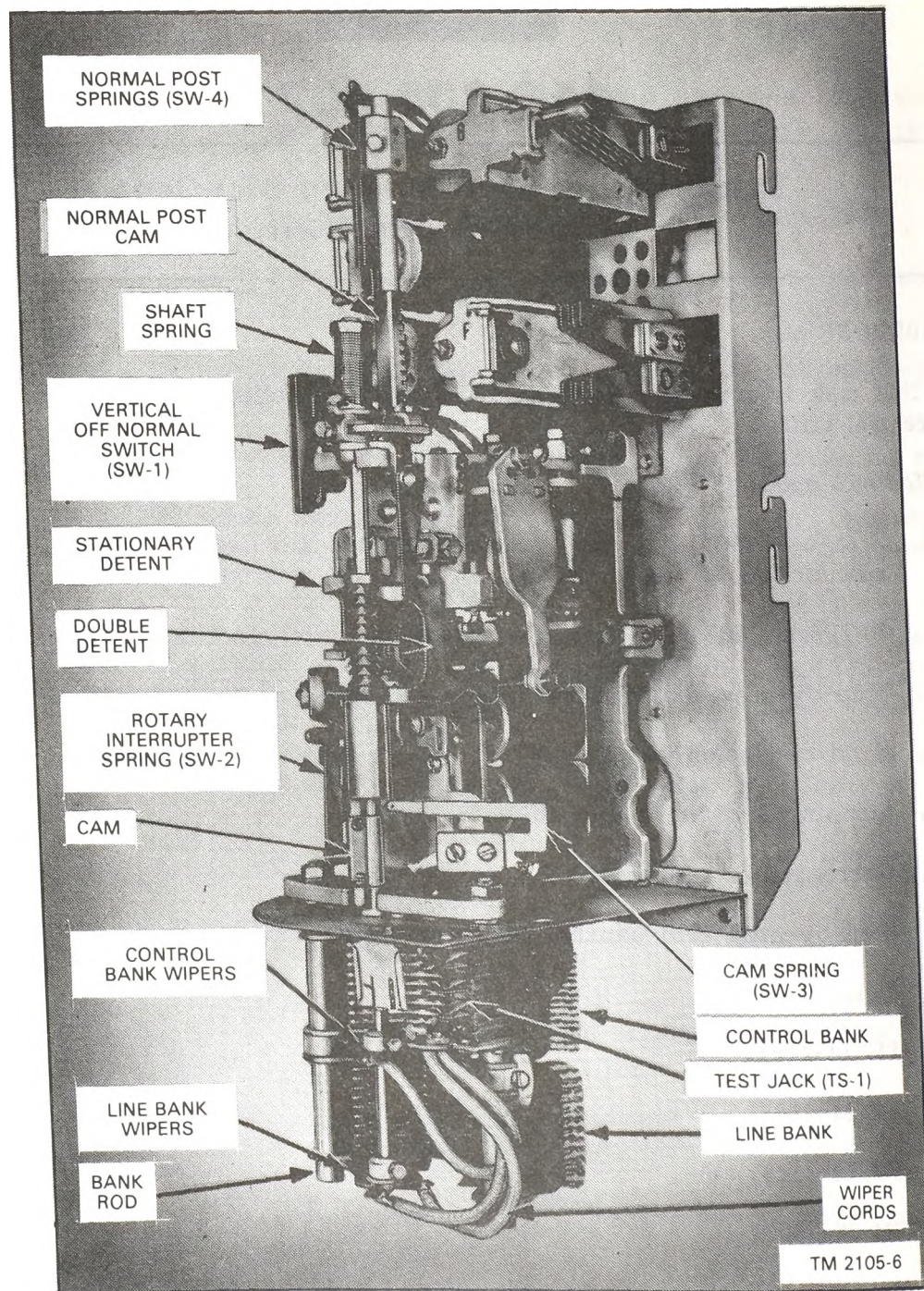


Figure 1. Step-by-Step Dial Central Office Selector Switch (Typical First Selector).

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the selector switch trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a and 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the selector switch from service.
4. Inspect the selector for defects that can be observed easily. (Refer to TM 11-2105, para 29b, p 56; TM 11-2103, para 8b, pp 4 and 5; manufacturer's schematic and wiring diagrams.)
5. Localize the most likely set(s) of "possible cause" by comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2105, para 30a, pp 56 and 57.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2105, para 30a, pp 56 and 57; manufacturer's schematic and wiring diagrams.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2105, w/C1, Selectors and Connectors Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

Manufacturer's schematic and wiring diagrams.

TASK**113-604-4021**

Repair Step-by-Step Dial Central Selector Switch

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Defective step-by-step dial central office selector switch.
2. DA Form 2407 with the selector switch defect(s) listed in column 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. Step-by-step dial central office special tools.
5. Test stand.
6. Hand test telephone.
7. Stepping-switch test set.
8. Current-flow test set.
9. Step-by-step dial central office test desk.
10. Pen.
11. TM 11-2103.
12. TM 11-2105.
13. TM 11-2111.

SKILL LEVEL 1

14. TM 38-750.
15. TB SIG 222.
16. Manufacturer's relay adjustment sheets.
17. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the selector switch defects have been corrected and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a and 19b, pp 20 thru 27.)
2. Review the defect(s) listed in column 20 of the DA Form 2407.
3. Remove the selector from service (if that has not already been done) in one of the following ways. (Refer to TM 11-2105, para 28, p 55.)
 - a. Operate the busy switch on the associated linefinder. (Regular first selectors only.)
 - b. Short-circuit test jack contacts 3 and 4. (Other selectors.)
4. Remove the switch from its shelf. (Refer to TM 11-2105, para 32, p 58; TM 11-2103, para 47, p 48.)

NOTE: Step 5 is concerned with the repair of relays. Perform the part of step 5 that applies to the needed repair action(s), either adjustment (step 5a) or replacement (step 5b). If neither action is required, go to step 6.

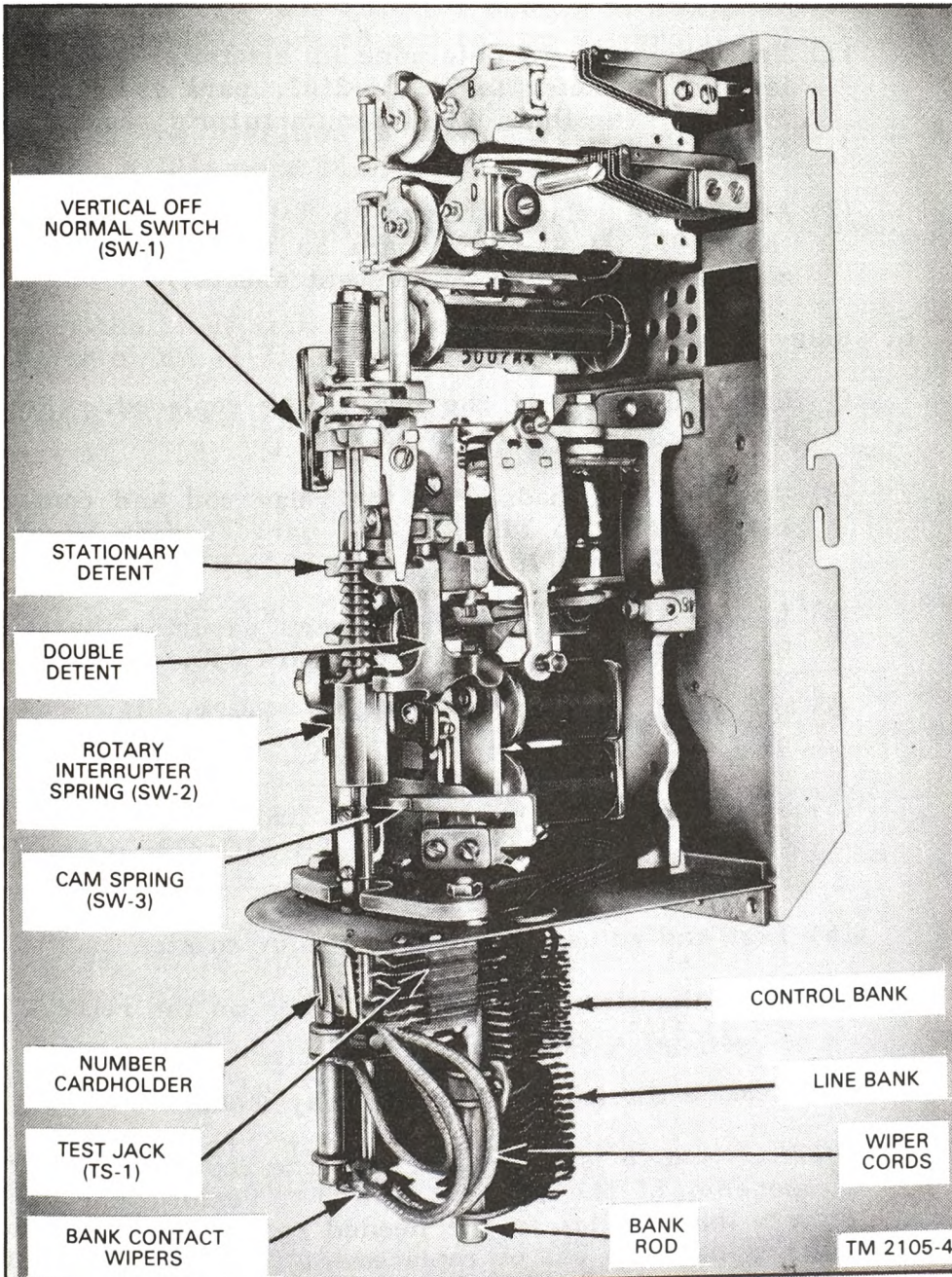


Figure 1. Step-by-Step Dial Central Office Selector Switch (Typical Second Selector).

5. a. Relay adjustment.

- (1) Test the relay to determine its electrical operating characteristics. (Refer to TM 11-2103, para 56a(4), p 71; para 59, pp 76 thru 84; manufacturer's relay adjustment sheets.)
- (2) Adjust the relay. (Refer to TM 11-2105, para 32, pp 58 thru 69; TM 11-2103, para 56 thru 63; pp 70 thru 92; manufacturer's relay adjustment sheets.)

b. Relay replacement.

- (1) Label the leads of the relay to be replaced. (Refer to TM 11-2103, para 64a(1), p 93.)
- (2) Unsolder the leads from the relay coil and contact assembly. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; TB SIG 222, para 55 thru 59, pp 2 thru 6.)
- (3) Remove the two mounting screws securing the relay to the base. (Refer to TM 11-2103, para 64b, p 93.)
- (4) Replace the relay. (Refer to TM 11-2103, para 64b, p 93.)
- (5) Solder the leads to the relay. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; TB SIG 222, para 55 thru 60, pp 2 thru 8.)
- (6) Test and adjust the relay. (Refer to step 5a.)
- (7) Mark the circuit designation letter on the relay. (Refer to TM 11-2103, para 64b, p 93.)
- (8) Remove the labels from the relay leads.

NOTE: Step 6 is concerned with the repair of mechanical components of the selector switch. Perform the part of step 6 that applies to the needed repair action(s), either adjustment (step 6a) or replacement (step 6b). If neither action is required, go to step 6c.

6. a. Adjust any stepping switch components that require adjustment to meet the standards specified in the reference. (Refer to TM 11-2103, para 48 thru 50, pp 48 thru 59.)

- b. Replace any part(s) or component(s) that are damaged or excessively worn with new part(s) or component(s). (Refer to TM 11-2103, para 65 and 66, pp 96 thru 103; TM 11-2105, para 31, p 58.)
- c. Test the operation of the switch. (Refer to TM 11-2103, para 67, p 103; para 34, p 25.)

NOTE: If the switch was not removed from its shelf, go to step 11.

7. Clean the shelf jack springs and the male contacts on the spring. (Refer to TM 11-2103, para 47b, p 48.)
8. Remove the switch from the test stand. (Refer to TM 11-2105, para 32, p 58; TM 11-2103, para 47a, p 48.)
9. Position the switch on its shelf. (Refer to TM 11-2103, para 47b, p 48; TM 11-2105, para 32, p 58.)
10. Test the operation of the switch. (Refer to TM 11-2103, para 67, p 103; para 34, p 25.)
11. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
12. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2105, w/C1, Selectors and Connectors Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

WB SIG 222, w/C1, Solder and Soldering, Mar 60.

CCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

SKILL LEVEL 1

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

Manufacturer's schematic and wiring diagrams.

TASK**113-604-0022**

**Troubleshoot Step-by-Step Dial Central Office
Connector Switch**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office connector switch with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Step-by-step dial central office special tools.
4. Hand test telephone.
5. Stepping-switch test set.
6. Current-flow test set.
7. Connector routine test set.
8. Step-by-step dial central office test desk.
9. Pen.
10. TM 11-2103.
11. TM 11-2105.
12. TM 11-2111.
13. TM 38-750.

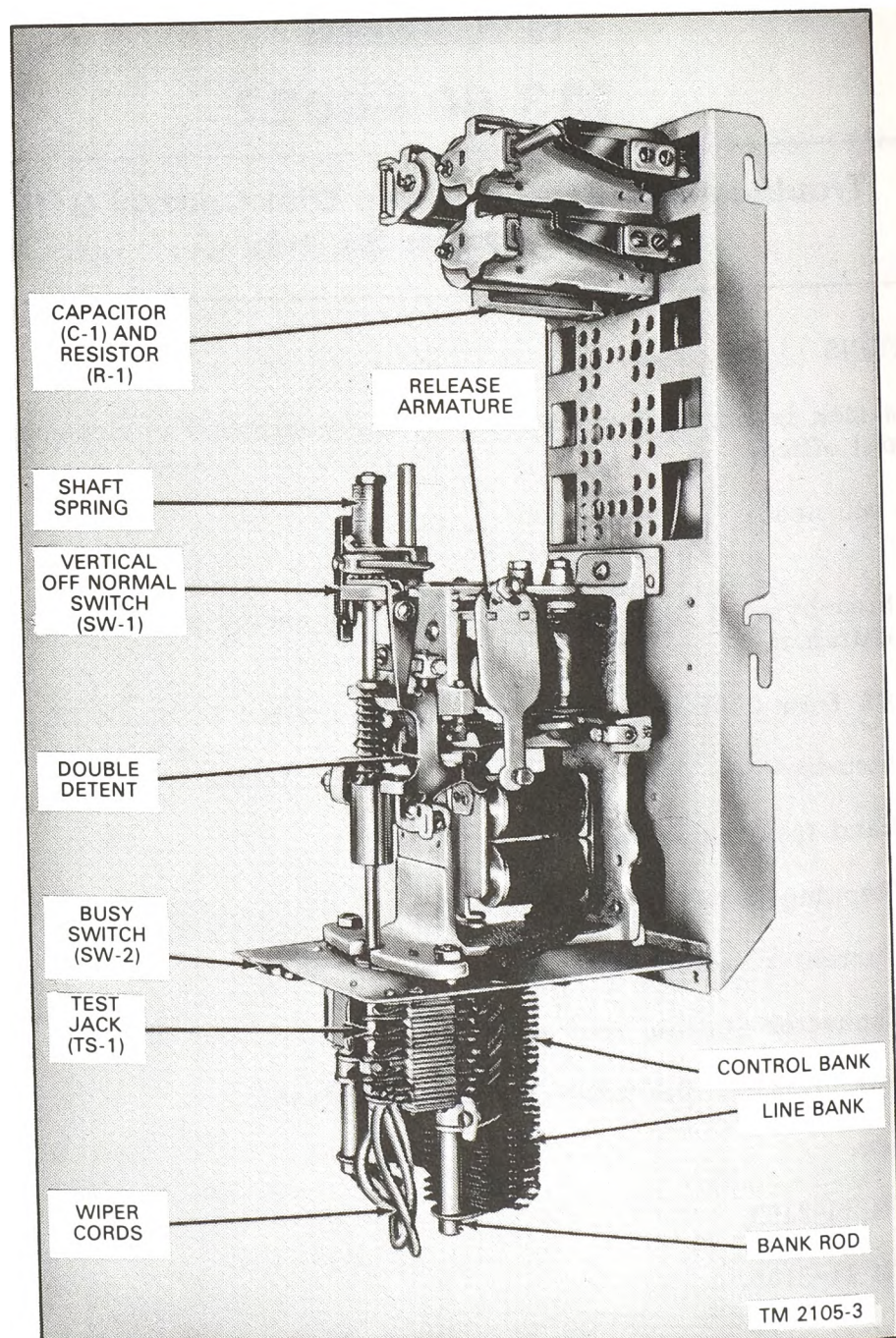


Figure 1. Step-by-Step Dial Central Office Connector Switch (Typical 100-Point Test Connector).

14. Manufacturer's schematic and wiring diagrams (with installed wiring options marked).

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the connector switch trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2117, para 19a and 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the connector switch from service.
4. Inspect the connector for defects that can be observed easily. (Refer to TM 11-2105, para 29b, p 56; TM 11-2103, para 8b, pp 4 and 5; manufacturer's schematic and wiring diagrams.)
5. Localize the most likely set(s) of "possible cause" by comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2105, para 30b, p 57.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2105, para 30b, p 57; manufacturer's schematic and wiring diagrams.)
7. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2105, w/C1, Selectors and Connectors Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

Manufacturer's schematic and wiring diagrams.

TASK**113-604-0023**

**Troubleshoot Step-by-Step Dial Central
Office Repeaters**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office repeater in a group of fire repeaters or trunk (pulse) repeaters with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Step-by-step dial central office special tools.
4. Hand test telephone.
5. Test telephone.
6. Current-flow test set.
7. Pen.
8. TM 11-2106.
9. TM 11-2111.
10. TM 38-750.
11. Manufacturer's schematic and wiring diagrams (with installed wiring options marked).
12. Assistance of maintenance personnel at a distant central office.

Supervision and assistance are available.

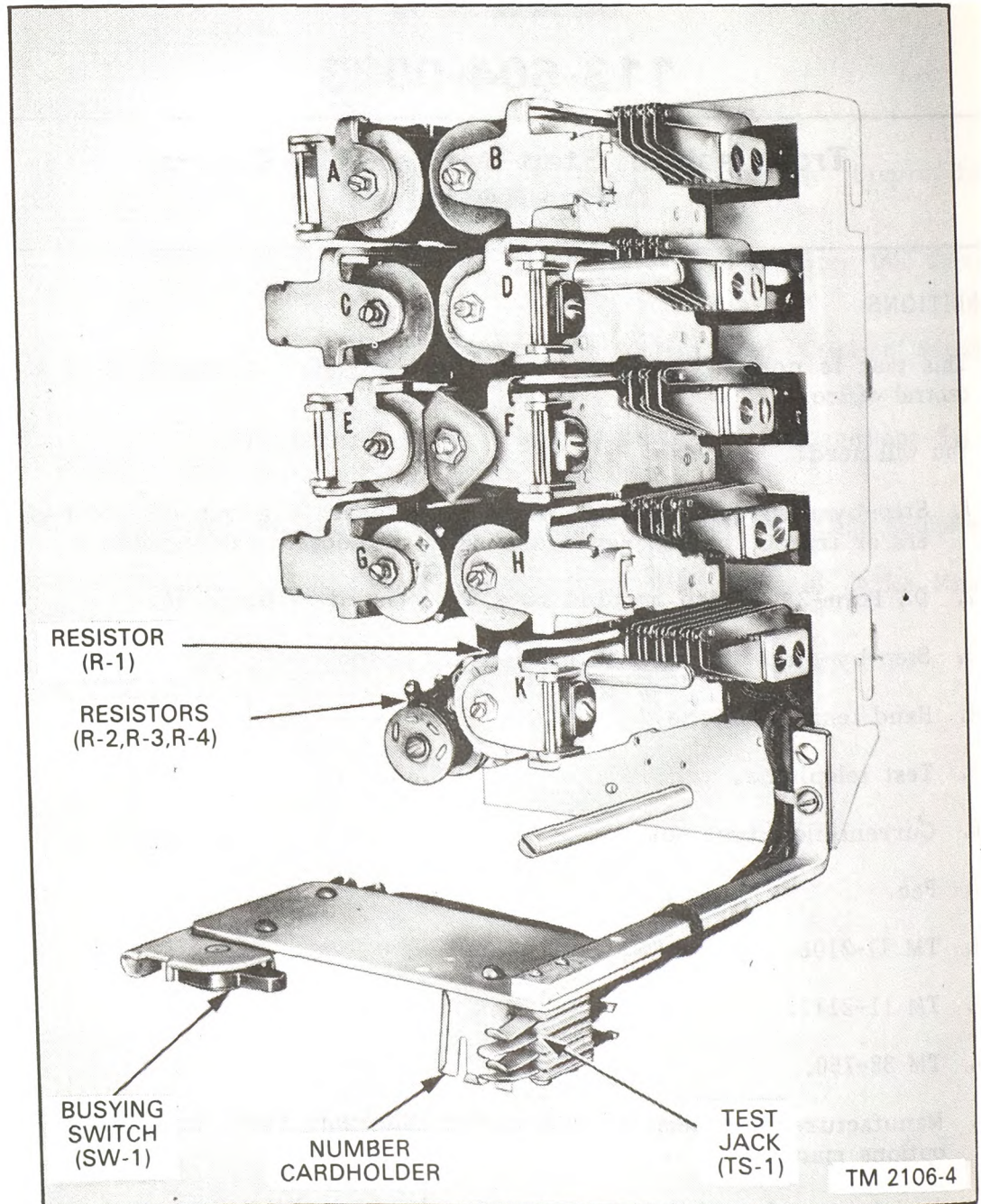


Figure 1. Step-by-Step Dial Central Office Repeater (Typical Trunk (Pulse) Repeater).

STANDARDS

Task standard has been completed when the causes of the selector group trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2111, para 19a and 19b, pp 20 thru 27.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the malfunctioning repeaters from service by operating Busying Switch (SW-1). (If repeater is used as a two-way or incoming repeater notify distant office.)
4. Inspect repeater for defects that can be observed easily. (Refer to TM 11-2106, para 32b, p 57; manufacturer's schematic and wiring diagrams.)

NOTE 1: Perform the part of step 5 which pertains to the type of repeater being examined. step 5a concerns fire repeaters; step 5b pertains to trunk repeaters.

NOTE 2: During the test (step 5), compare the test results with the standards of equipment performance presented in the references.

5. Test the operation of the repeater.
 - a. Fire repeaters. (Refer to TM 11-2106, para 18d, p 16; para 22, pp 18 thru 24.)
 - b. Trunk (pulse) repeaters. (Refer to TM 11-2106, para 18e, p 16; para 24 thru 26, pp 26 thru 47.)
6. Sectionalize the trouble to a particular repeater by repeating the applicable test in step 5 for all repeaters of the same type.

7. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 5 with those listed in the "symptom" column of the applicable troubleshooting chart. (Refer to TM 11-2106, para 33a thru 33d, pp 58 and 59.)
8. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 7. (Refer to TM 11-2106, para 33a thru 33d, pp 58 and 59.)
9. Record the entries required in columns 20b,e,g,h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
10. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2106, w/C1, Miscellaneous Switching Equipment: Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

Manufacturer's schematic and wiring diagrams.

ACCP Subcourse SSO 415, Step-by-Step Dial Central Office Equipment.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

TASK

113-604-2001

Perform Operating Procedure for Step-by-Step Dial Central Office Test Desk Type No. 1

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step dial central office equipment to be tested.
2. Type No. 1 test desk.
3. DA Form 2407 which indicates the kind of test to be performed, and which will serve as a record of completed maintenance actions.
4. Pen.
5. TM 11-2110.
6. TM 38-750.
7. Technical manual(s) pertaining to the equipment item(s) being tested.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the operation of the equipment designated on DA Form 2407 has been tested and evaluated as described in TM 11-2110 and the technical manuals that apply to that equipment. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Examine the controls, and insure that all switches are in the normal or nonoperated position. (Refer to TM 11-2110, para 11, pp 13 thru 16.)

NOTE 1: In step 3, choose the test required by the troubleshooting or repair task for which the test desk is being used.

NOTE 2: Compare the results obtained in step 3 with the standards of equipment operation presented in the technical manual that applies to the equipment item(s) being tested.

3. Operate the test desk to perform the applicable test(s) in the following categories:
 - a. Test trunk circuits. (Refer to TM 11-2110, para 14, pp 22 thru 24.)
 - b. Line tests with primary test cord. (Refer to TM 11-2110, para 15, pp 24 thru 29.)
 - c. Station equipment tests with auxiliary test cord circuit. (Refer to TM 11-2110, para 16, pp 29 and 30.)
 - d. Wheatstone bridge tests. (Refer to TM 11-2110, para 17, pp 30 thru 34.)
4. Determine whether the tested equipment requires further repair based on the standards of equipment performance. (Refer to the technical manuals pertaining to the equipment item(s) being tested.)
5. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9, p 3-28; p A-7, table A-5.)

REFERENCES

TM 11-2110, w/C1 and 2, Test Desk Equipment and Techniques Step-by-Step Dial Central Office Equipment, Jun 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

Technical manual(s) pertaining to the equipment item(s) being tested.

ACCP Subcourse SSO 424, Step-by-Step Dial Central Office Repair.

TASK

113-574-2005

Perform an Operation Test of Step-by-Step Linefinders Using the Hand Test Telephone

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step linefinder switches installed in a dial central office.
2. Hand test telephone.
3. Pen.
4. DA Form 2404 for recording routine test results.
5. DA Form 2407 for recording required maintenance actions.
6. TM 11-2103.
7. TM 11-2111.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when all A and B linefinder groups in the facility have been tested and evaluated as described in the performance measures and the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

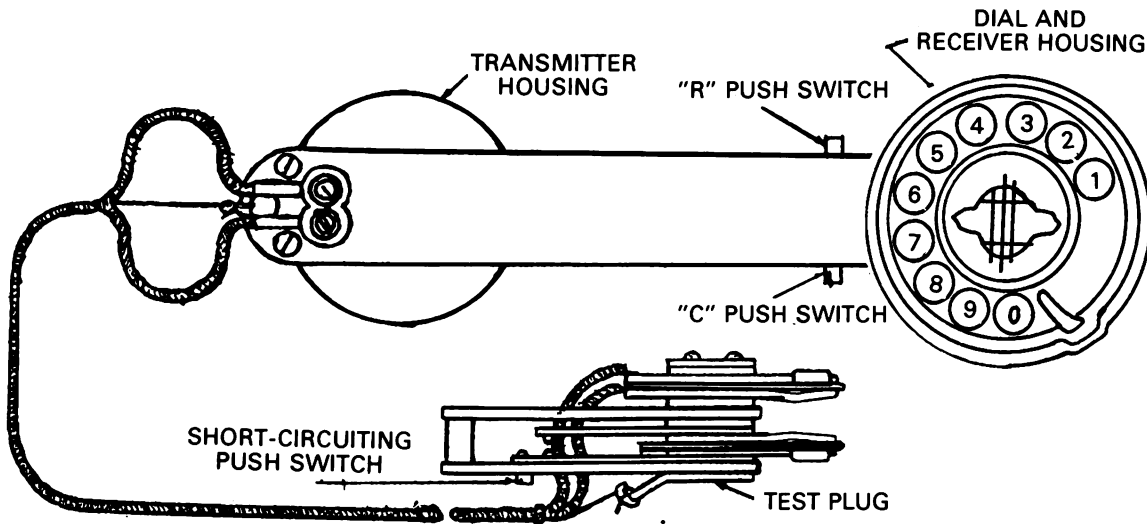


Figure 1. Hand Test Telephone.

PERFORMANCE MEASURES

1. Obtain the tools, equipment, and materials listed under CONDITIONS.
2. Perform linefinder operation test using the hand test telephone. (Refer to TM 11-2103, para 31b, p 22.)
3. Determine whether the linefinder switches require troubleshooting and/or repair based on the standards of equipment performance. (Refer to step 2.)
4. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required, (Refer to TM 38-750, para 3-9c(1) and 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

ACCP Subcourse SSO 424, Step-by-Step Dial Central Office Repair.

TASK**113-574-2003**

**Perform Routine Selector Tests with the
Stepping-Switch Test Set**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step selector switches installed in a dial central office.
2. DA Form 2407 for recording required maintenance actions.
3. DA Form 2404 for recording routine test results.
4. Stepping-switch test set.
5. Hand test telephone.
6. Pen.
7. TM 11-2103.
8. TM 11-2111.
9. TM 11-2114.
10. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the operation of the selector switches has been tested and evaluated as described in the performance measures and the references. These actions will be done in

accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

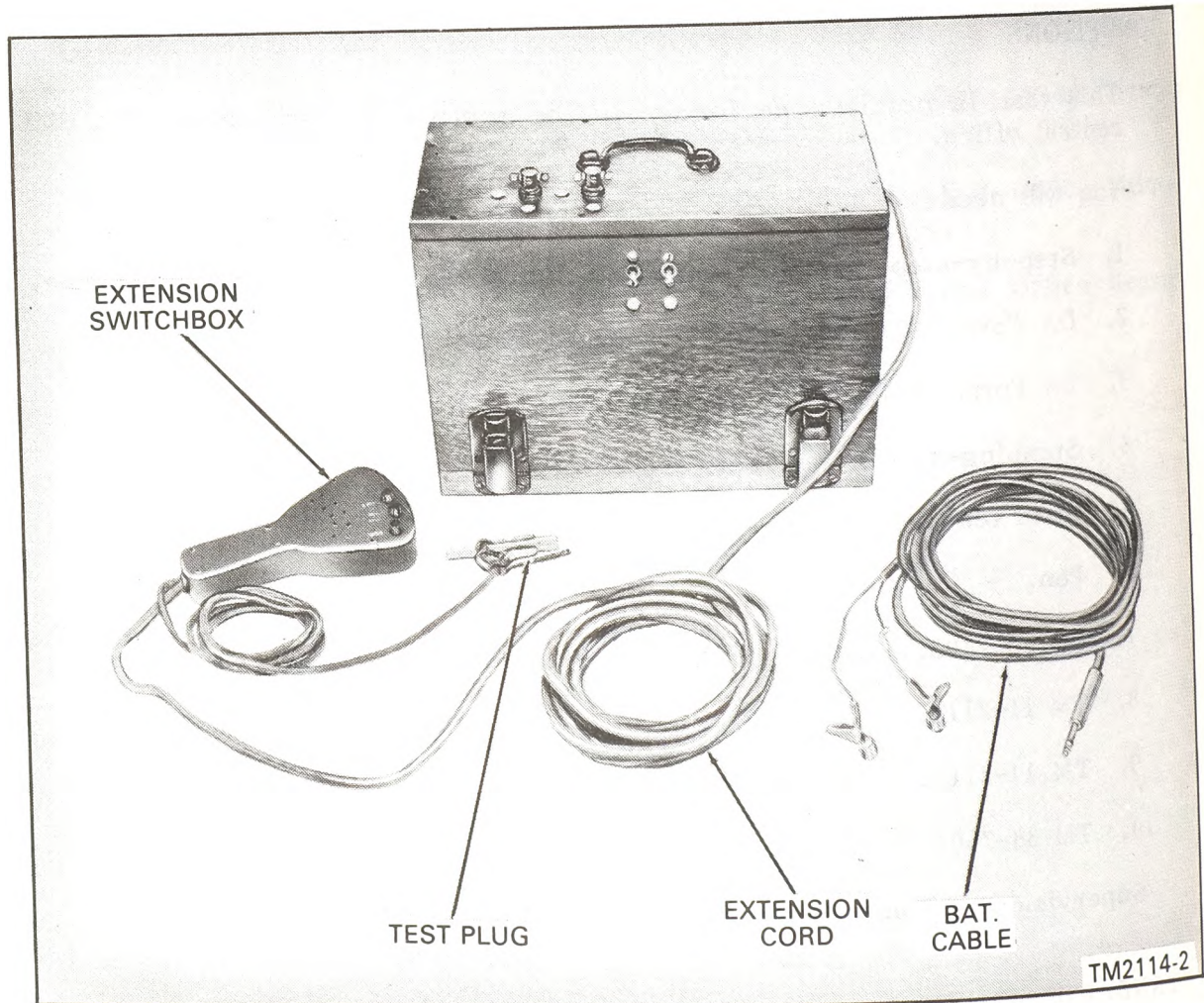


Figure 1. Stepping-Switch Test Set

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Perform the selector tests with the stepping-switch test set. (Refer to TM 11-2114, para 9, p 6; para 11, p 8.)
3. Determine whether any of the tested selectors require troubleshooting and/or repair, based on the standards of equipment performance. (Refer to step 2.)
4. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) and 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2111, w/C1, Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment, May 50.

TM 11-2114, Stepping-Switch Test Set (Step-by-Step Dial Central Office Equipment), Jun 49.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

ACCP Subcourse SSO 424, Step-by-Step Dial Central Office Repair.

TASK

113-574-2004

Perform Connector Ringing, Talking and Busy Tests with the Connector Routine Test Set

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Step-by-step connector switches installed in a dial central office.
2. DA Form 2404 for recording routine test results.
3. DA Form 2407 for recording required maintenance actions.
4. Connector routine test set.
5. Pen.
6. TM 11-2103.
7. TM 11-2113.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the operation of the connector switch has been tested and evaluated as described in the performance measures and the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Prepare connector routine test set for use. (Refer to TM 11-2113, para 20, p 9.)
3. Perform connector stepping switch tests. (Refer to TM 11-2113, para 21, pp 10 and 11.)
4. Determine whether the connectors require troubleshooting and/or repair based on the standards of equipment performance. (Refer to TM 11-2113, para 21b, p 10.)
5. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) and 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2113, w/C1 and 2, Connector Routine Test Set: Step-by-Step Dial Central Office Equipment, Mar 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 416, Step-by-Step Dial Central Office Maintenance.

ACCP Subcourse SSO 424, Step-by-Step Dial Central Office Repair.

TASK**113-604-1008**

Install Cross-Connections on Distribution Frames

CONDITIONS

This task is normally performed in the controlled environment of a telephone central office.

You will need:

1. Jumper wire to be installed on a distribution frame in a telephone central office. (Number of conductors depends on circuit and is listed on running sheets.)
2. Distribution frame with cables installed.
3. Supervisor's instructions for installing cross-connections.
4. Wire stripper.
5. Pliers.
6. Soldering iron and/or wire wrapping tool.
7. Rosin-core solder (if any connections are to be soldered).
8. Orange stick or fiber spudger.
9. Canvas.
10. Container for scrap materials.
11. Pen.
12. Pencil.
13. Central office cable records (DA Form 4204).

14. Running sheets.
15. TM 11-2102.
16. CCTM 105-50-21.
17. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the jumper wires have been installed according to the running sheets, and the cable records have been filled out as specified in the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and references listed under CONDITIONS.
2. Run jumpers as required. (Refer to the running sheets; TM 11-2102, para 185b, 186, 187, and 189 thru 214, pp 155 thru 174.)
3. Untwist the jumper conductors within the fanning strip, but keep the jumpers twisted immediately behind the fanning strip. (Refer to TM 11-2102, para 188a, p 157.)
4. Secure the jumper wire, so that the end of the wire from which the insulation is to be removed can be held taut. (Refer to TM 11-2102, para 188c(1), p 158.)
5. Grip the jumper wire at the point where the removal of insulation will begin and hold it taut with one hand. (Refer to TM 11-2101, para 188c(1), p 158.)
6. Remove the insulation from the end of the wire, and if the wire is enameled, remove all the enamel from the wire. If the wire will be soldered, remove no more than 3/4 inch of insulation from the end of the wire. (Refer to TM 11-2102, para 188c(2), p 158.)

NOTE 1: Perform steps 6 and 7 for both ends of all jumpers in a group of jumpers to be connected.

NOTE 2: In connecting jumpers to terminals (step 8), connections on the vertical side of the distributing frame have precedence over connections on the horizontal side.

7. Connect the jumpers to the terminals using the method from the following pair of methods that is acceptable under local conditions:
 - a. Soldered connections. (Refer to TM 11-2102, para 188d and 188e, p 158; CCTM 105-50-21, para 3-19, pp 3-125 thru 3-134; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8; fig 1.)
 - (1) Grip the jumper behind the fanning strip.
 - (2) Adjust the wire so the insulation will just fit into the notch in the terminal.
 - (3) Wrap the skinned wire one turn around the terminal.
 - (4) Cut or break off the excess wire.

NOTE: Perform steps 8a(1) through 8a(4) for both ends of all jumpers to be connected.

- (5) Solder the connections.

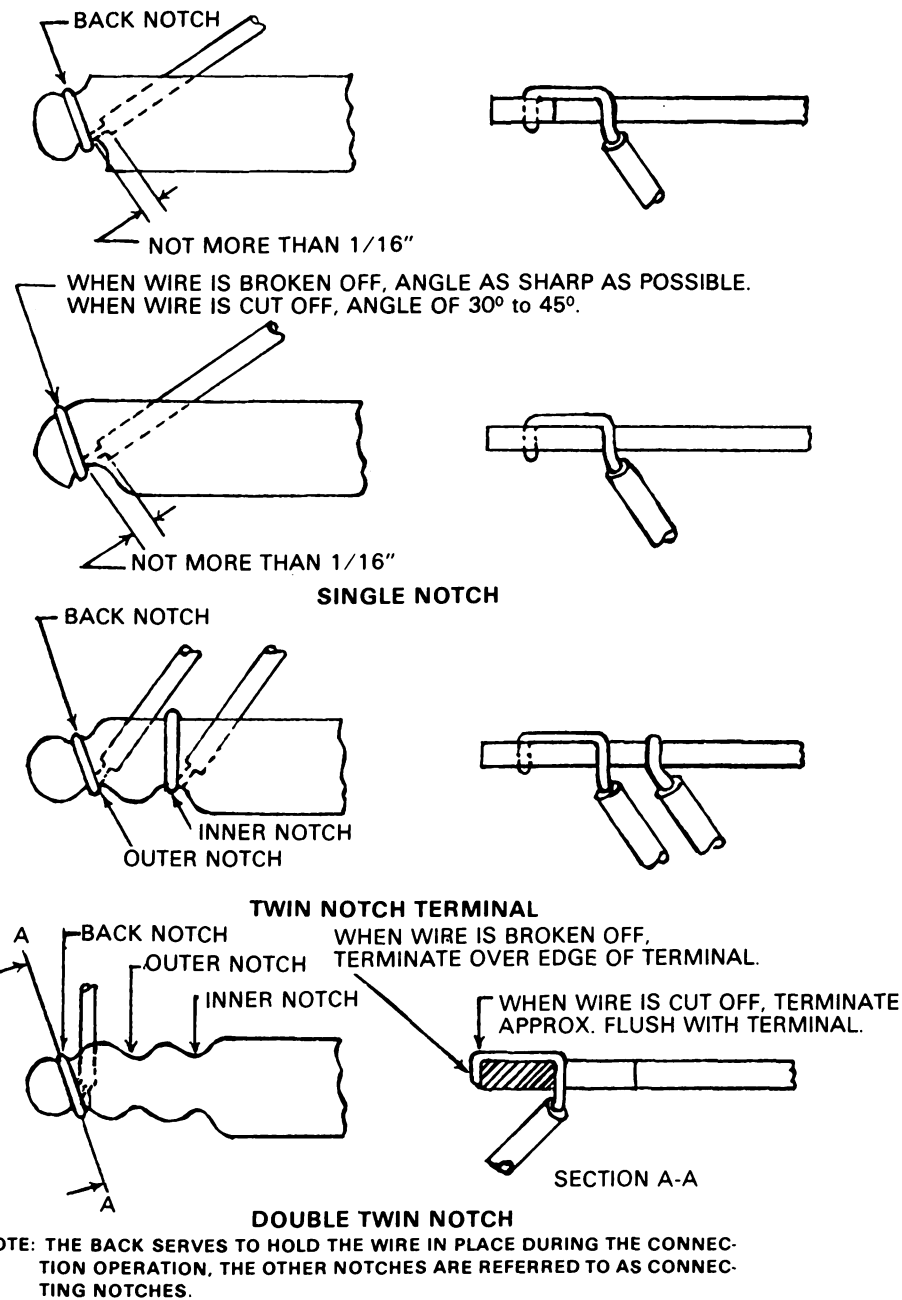


Figure 1. Connecting Wires at Various Types of Notched Terminals.

b. Wrapped connections. (Refer to CCTM 105-50-21, para 3-20, pp 3-134 thru 3-138, fig 2.)

- (1) Straighten the working length of wire.
- (2) Slide the skinned wire into the feed slot of the wrapped bit.
- (3) Wrap the wire around the terminal.

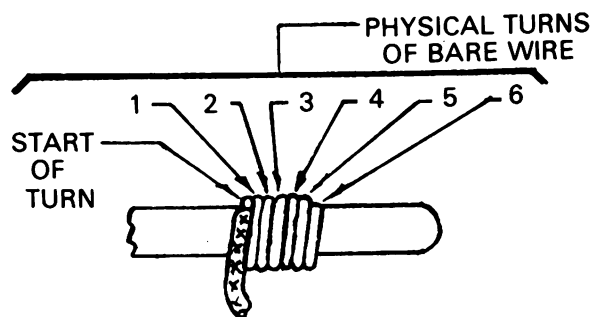


Figure 2. Solderless Wrapped Connection.

NOTE 1: Perform steps 8b(1) through 8b(3) for both ends of all jumpers in a group of jumpers to be connected.

NOTE 2: Perform steps 3 through 8 for all distribution frame cross-connections.

8. Record the required entries on Cable Record DA Form 4204. (Refer to TM 11-2102, para 185e, pp 155 and 156, and the local SOP.)
9. Notify the supervisor that the distribution frame cross-connections have been completed.

REFERENCES

TM 11-2102, Installation Instructions, Step-by-Step Dial Central Office Equipment, Jun 50.

CCTM 105-50-21, Telecommunications Engineering - Installation Practices: (Installation - General), Mar 74.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 421, Installation of Dial Central Office Equipment.

TASK

113-604-1009

Remove Cross-Connections from Distribution Frames

CONDITIONS

This task is normally performed in the controlled environment of a telephone central office.

You will need:

1. Jumper wires installed on a distribution frame in a telephone central office.
2. Supervisor's instructions for removing cross-connections.
3. Diagonal cutters.
4. Pliers.
5. Soldering iron.
6. Rosin-core solder.
7. Hand test telephone.
8. Orange stick or fiber spudger.
9. Canvas.
10. Pen.
11. Pencil.
12. Central office cable records (DA Form 4204).
13. TM 11-471.
14. TM 11-2102.

15. CCTM 105-50-21.

16. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the specified jumper wires have been removed from the distribution frame as specified in the performance measures and the changes have been recorded in the cable record file. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment so that the equipment will not be damaged, and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Cover the equipment on the shelves below the jumpers to be removed with a piece of canvas. (Refer to TM 11-471, para 132, p 163.)
3. Check the cross-connections to be removed to insure that they are not operational. (Refer to TM 11-471, para 133, pp 163 and 164.)
4. Cut the jumper(s) to be removed about two inches from the terminal lugs, pull them out from the terminal strip so they can be seen easily. (Refer to TM 11-471, para 132 and 133b, pp 163 and 164.)
5. Pull the cut jumper ends clear of the terminal strips on both ends of the jumper. (Refer to TM 11-471, para 132 and 133b, pp 163 and 164.)
6. Remove the cross-connections from the terminals in one or both of the following ways (whichever applies):
 - a. Soldered connections.
 - (1) Unsolder the cross-connections. (Refer to TM 11-471, para 132 and 133b, pp 163 and 164.)

- (2) Clean the solder from the formerly soldered parts. (Refer to TM 11-471, para 132 and 133b, pp 163 and 164; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
- b. Wrapped connections. Unwrap the wire from the terminal. (Refer to CCTM 105-50-21, para 3-20, pp 3-134 thru 3-138.)
7. Record the changes in cross-connections on the central office cable records (DA Form 4204). (Refer to TM 11-2102, para 185e, pp 155 and 156.)
8. Notify the supervisor that the cross-connections have been removed from the distribution frame.

REFERENCES

TM 11-471, Manual Telephone Central Office Installation, Jul 45.

TM 11-2102, Installation Instructions, Step-by-Step Dial Central Office Equipment, Jun 50.

CCTM 105-50-21, Telecommunications Engineering - Installation Practices: (Installation - General), Mar 74.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 421, Installation of Dial Central Office Equipment.

TASK

113-604-0056

Troubleshoot Combined Distribution Frame

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Circuit localized to the combined distribution frame with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Central office tools.
4. Pen.
5. TM 11-2103.
6. TM 11-2109.
7. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the defective circuit's trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

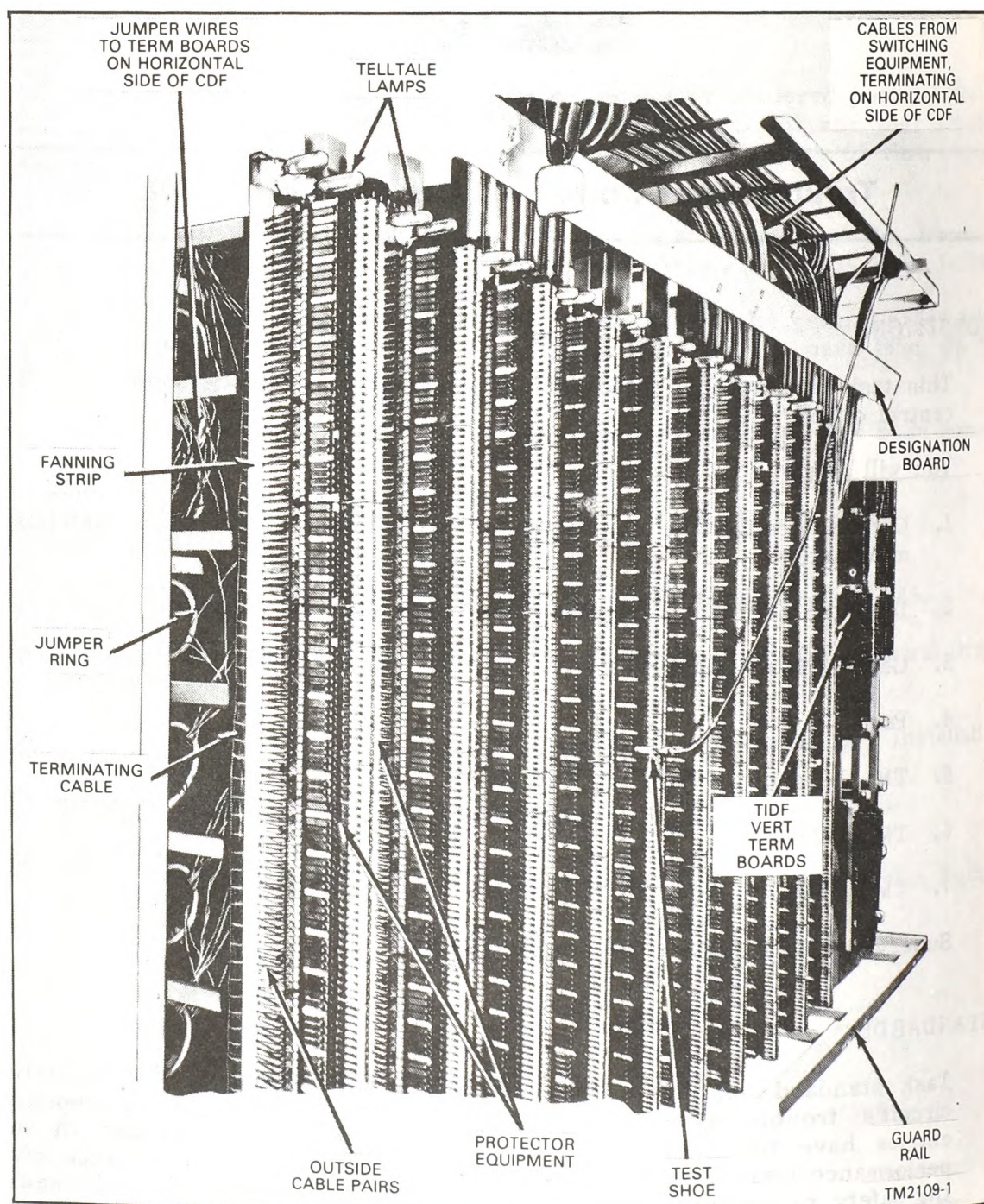


Figure 1. Combined Distribution Frame and Trunk Intermediate Distributing Frame, Vertical Side.

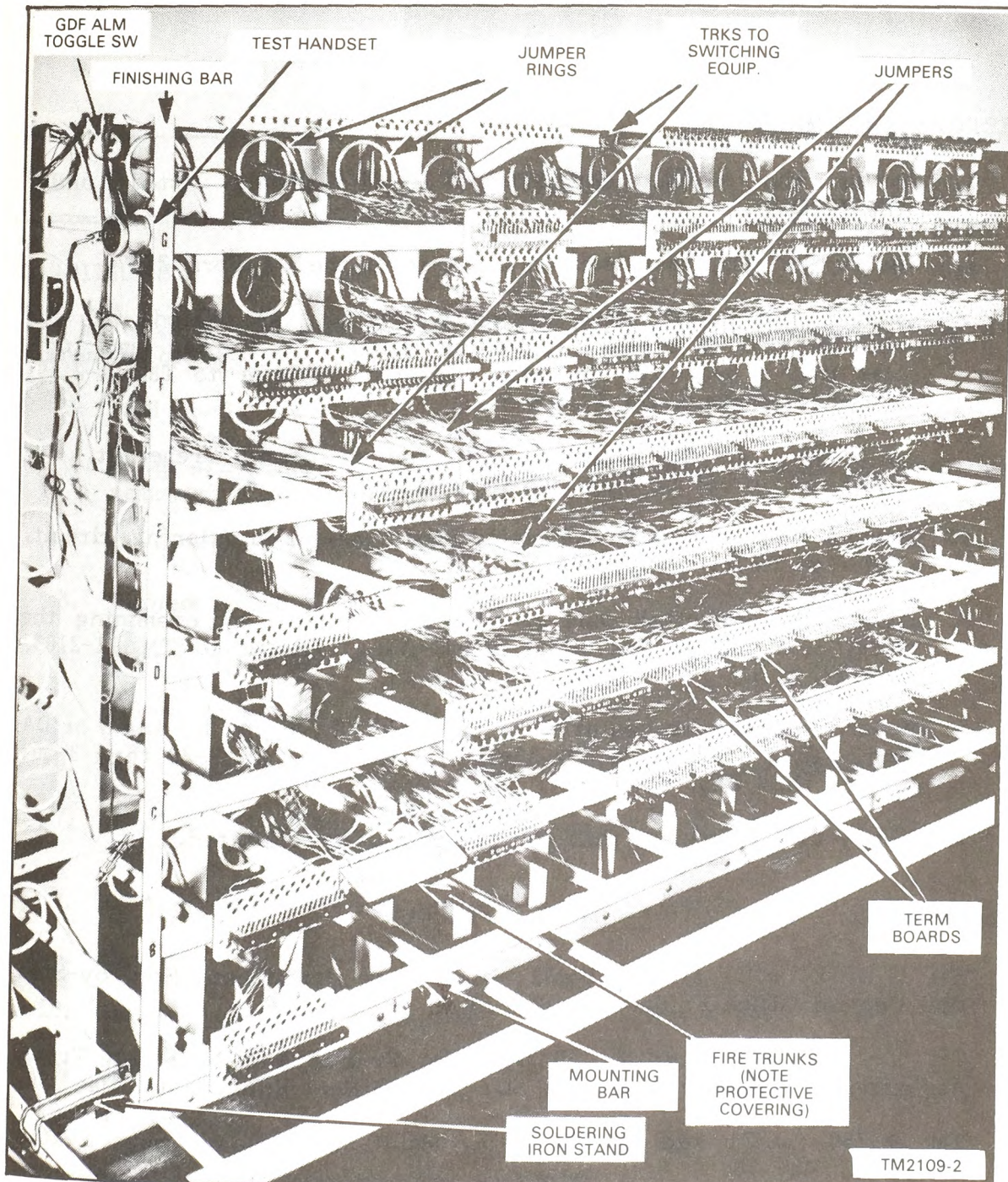


Figure 2. Trunk Intermediate Distributing Frame and Combined Distribution Frame, Horizontal Side.

PERFORMANCE MEASURES

1. Obtain the tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the telltale lamp assembly (fig 1), associated with the protector pair of the malfunctioning circuit. A lighted lamp indicates that a heat coil has been operated. (Refer to TM 11-2109, para 6b(4) and 6c, pp 7 thru 9.)

NOTE: If an operated heat coil is found, reset it.
(Refer to TM 11-2109, para 40, p 50.)

4. Examine the protector associated with the malfunctioning circuit. (Refer to TM 11-2109, para 6b, p 5.)
5. Isolate the defective part(s) or component(s) by examining the circuit components for signs of trouble. (Refer to TM 11-2103, para 12, p 8.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2103, w/C1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-2109, w/C1 and 2, Distributing Frames and Line and Trunk Assignments Step-by-Step Dial Central Office Equipment, May 50.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-1015**

Connect Strapping to DTA

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Strap Wire #22-109-BLK, skinned with short lengths of insulation removed at properly measured intervals.
2. Strap Wire #22-73-BLK.
3. Tinned Copper Wire #22 bare.
4. Pliers, diagonal cutting, 4 inch or 6 inch.
5. Pliers, long nose, 4 inch or 6 inch.
6. Soldering iron, 60 to 125 watt, for DTAs required soldering.
7. Wire wrapping tool, manual or electric - if connections are to be wrapped rather than soldered.
8. DTA on which the strapping is to be installed.
9. Pen.
10. Manufacturer's DTA diagrams.
11. TM 11-2102.
12. TB SIG 222.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the straps have been installed as specified in the manufacturer's DTA diagrams, the performance measures and the references. These actions will be done in accordance with the precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and references listed under CONDITIONS.
2. Review the manufacturer's DTA diagrams.
3. Install the strap wire in the following modes as required:
 - a. Strapping requiring soldered connections. (Refer to the manufacturer's DTA drawings; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
 - (1) Vertical strapping between adjacent bank terminals. (Refer to fig 1.)
 - (a) Beginning at the top of the DTA, wrap an uninsulated wire end around the lower lug of the first "+", "-", or "C" terminal to be strapped.
 - (b) Run the strap through the next lower pair of lugs (for the next corresponding "+", "-", or "C" terminal) taking the wire into the lugs from the right of the top lug and exiting to the left of the bottom lug so that an uninsulated section of wire will make contact with the terminal lugs.
 - (c) Perform step 3a(1)(b) for succeeding terminals to be connected with the strap being run, not including the last terminal to be connected.

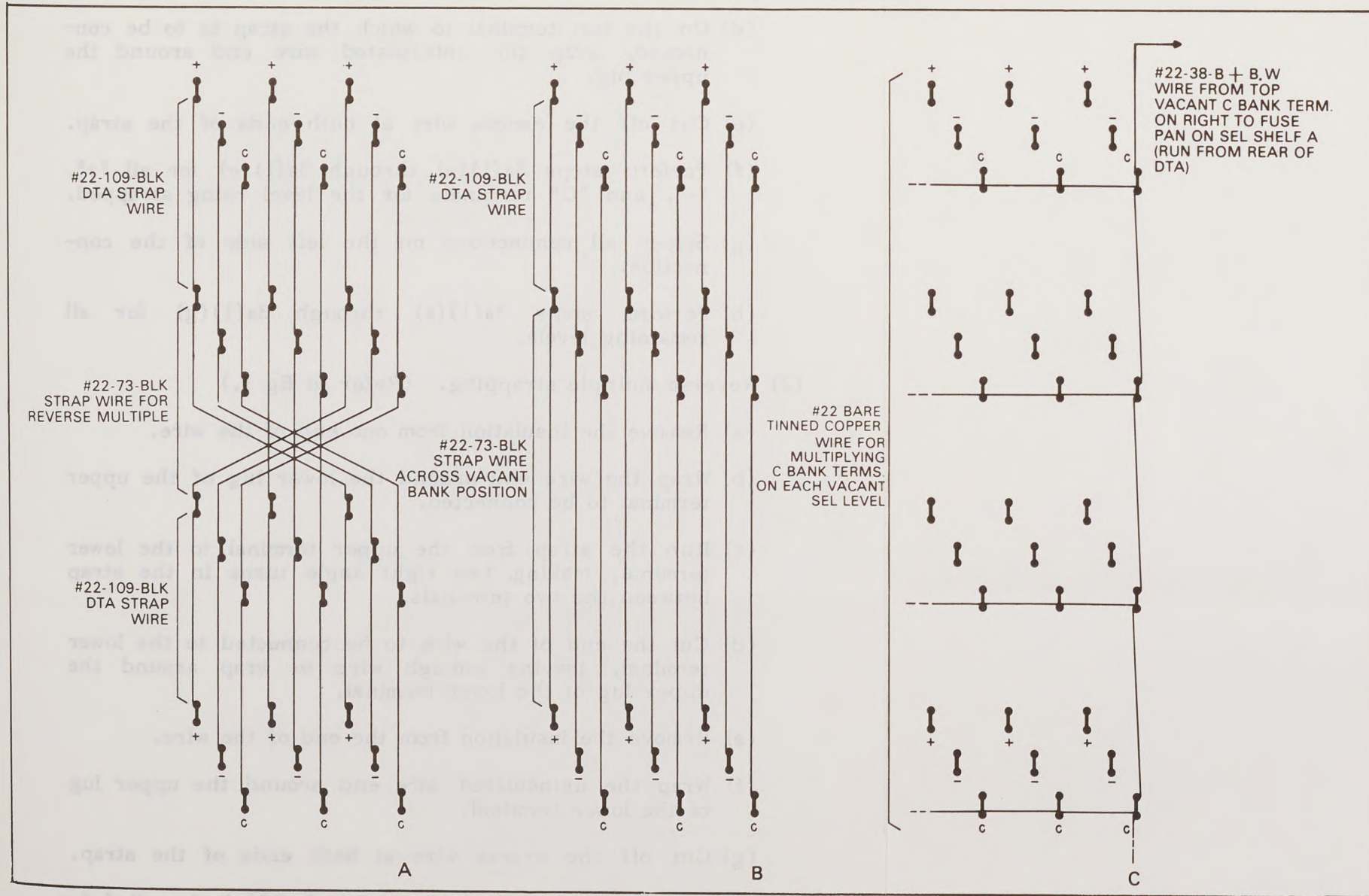


Figure 1. Types of Strapping on DTA Bank Terminal Boards.

SKILL LEVEL 1



- (d) On the last terminal to which the strap is to be connected, wrap the uninsulated wire end around the upper lug.
- (e) Cut off the excess wire at both ends of the strap.
- (f) Perform steps 3a(1)(a) through 3a(1)(e) for all "+", "-", and "C" terminals for the level being strapped.
- (g) Solder all connections on the left side of the connection.
- (h) Perform steps 3a(1)(a) through 3a(1)(g) for all remaining levels.

(2) Reverse multiple strapping. (Refer to fig 1.)

- (a) Remove the insulation from one end of the wire.
- (b) Wrap the wire end around the lower lug of the upper terminal to be connected.
- (c) Run the strap from the upper terminal to the lower terminal, making two right angle turns in the strap between the two terminals.
- (d) Cut the end of the wire to be connected to the lower terminal, leaving enough wire to wrap around the upper lug of the lower terminal.
- (e) Remove the insulation from the end of the wire.
- (f) Wrap the uninsulated wire end around the upper lug of the lower terminal.
- (g) Cut off the excess wire at both ends of the strap.
- (h) Perform steps 3a(2)(a) through 3a(2)(g) for all "+", "-", and "C" terminals for the level being strapped (reverse multiple).
- (i) Solder all connections on the left side of the connection.
- (j) Perform steps 3a(2)(a) through 3a(2)(i) for all remaining levels.

(3) Strapping across vacant bank positions. (Refer to fig 1.)

NOTE: If more than two vacant positions are to be bypassed, run jumpers instead of straps.

- (a) Remove the insulation from one end of the wire.
- (b) Wrap the wire end around the lower lug of the upper terminal to be connected.
- (c) Run the strap from the upper terminal to the lower terminal.
- (d) Cut the end of the wire to be connected to the lower terminal, leaving enough wire to wrap around the upper lug of the lower terminal.
- (e) Remove the insulation from the end of the wire.
- (f) Wrap the uninsulated wire end around the upper lug of the lower terminal.
- (g) Cut off the excess wire at both ends of the strap.
- (h) Perform steps 3a(3)(a) through 3a(3)(g) for all "+", "-", and "C" terminals for the level being strapped (across vacant bank positions.)
- (i) Solder all connections on the left side of the connection.
- (j) Perform steps 3a(3)(a) through 3a(3)(i) for all remaining levels.

(4) Multiplying "C" bank terminals on each vacant level of each bank. (Refer to fig 1.)

- (a) Wrap an end of the wire around the bottom lug of the left-most terminal to be connected.
- (b) As the wire is being run to the right-most terminal to be connected, lay it between the lugs of the corresponding consecutive terminals being connected.
- (c) Wrap the other end of the wire around the bottom lug of the last terminal to be connected.

- (d) Cut off the excess wire on both ends of the strap.
- (e) Perform steps 3a(4)(a) through 3a(4)(d) for all "C" bank terminals on all vacant levels to be strapped in this manner.
- (f) Solder all connections.
- (g) Beginning at the right uppermost "C" terminal to be connected vertically, shelf-to-shelf, wrap an uninsulated wire end around the lower lug of the terminal.
- (h) Run the strap through the next lower pair of "C" terminal lugs taking the wire into the gap between the lugs from the right of the top lug and exiting to the left of the bottom lug so that an uninsulated section of wire makes contact with the terminal lugs.
- (i) Perform step 3a(4)(h) for succeeding terminals, connecting right-hand "C" terminals on vacant levels vertically from shelf-to-shelf, not including the last terminal.
- (j) On the last terminal to which the strap is to be connected, wrap the uninsulated wire end around the upper lug.
- (k) Cut off the excess wire on both ends of the strap.
- (l) Solder all connections on the left side of the connection.

NOTE 1: Steps 3a(4)(m) through 3a(4)(q) apply to straps connected between the "C" bank terminals of adjacent vacant levels on the top bank only.

NOTE 2: Steps 3a(4)(r) through 3a(4)(v) apply to straps connected between the "C" bank terminals of adjacent vacant levels on any bank other than the top bank.

- (m) Beginning with the right-hand "C" terminal on the top shelf of the left-most vacant level, wrap an uninsulated wire end around the lower lug of the terminal.
- (n) Wrap the other end of the wire around the bottom lug of the left-hand "C" terminal on the top shelf of the adjacent vacant level.

(o) Cut off the excess wire on both ends of the strap.

(p) Perform steps 3a(4)(m) through 3a(4)(o) for other adjacent vacant levels on the top shelf.

(q) Solder the connections.

NOTE: Steps 3a(4)(r) through 3a(4)(v) apply to straps connected between the "C" bank terminals of adjacent vacant levels other than the top bank.

(r) Beginning at the left-most "C" terminal on the shelf (other than the top shelf) of the vacant level, wrap the end of the wire around the lower lug of the terminal.

(s) As the wire is being run to the right-most terminal to be connected, lay it between the lugs of the consecutive terminals being connected.

NOTE: A continuous strap will be run between adjacent levels on the shelf, as required by the manufacturer's DTA drawings.

(t) Wrap the other end of the wire around the bottom lug of the last terminal to be connected.

(u) Cut off the excess wire on both ends of the strap.

(v) Solder the connections.

(5) Horizontal strapping between adjacent bank terminals. (Refer to fig 2.)

(a) Perform steps 3a(4)(a) through 3a(4)(d) for all corresponding "+", "-", or "C" bank terminals to be strapped horizontally.

(b) Solder all connections.

b. Strapping requiring wrapped connections. (Refer to the manufacturer's DTA drawings.)

(1) Strapping between adjacent terminals. (Refer to fig 2.)

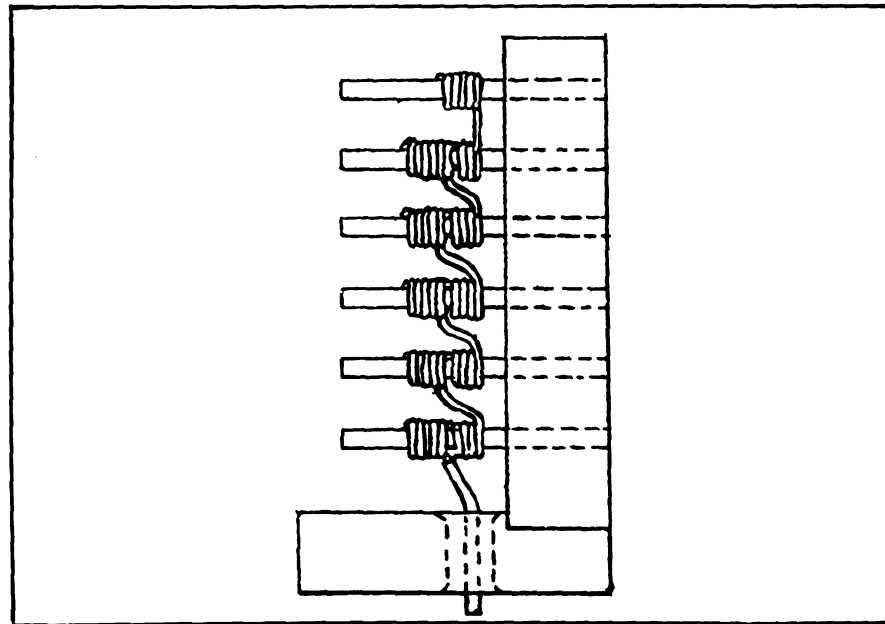


Figure 2. Strapping of Adjacent Wire Wrapped Terminals.
(2) Strapping between nonadjacent terminals. (Refer to fig 3.)

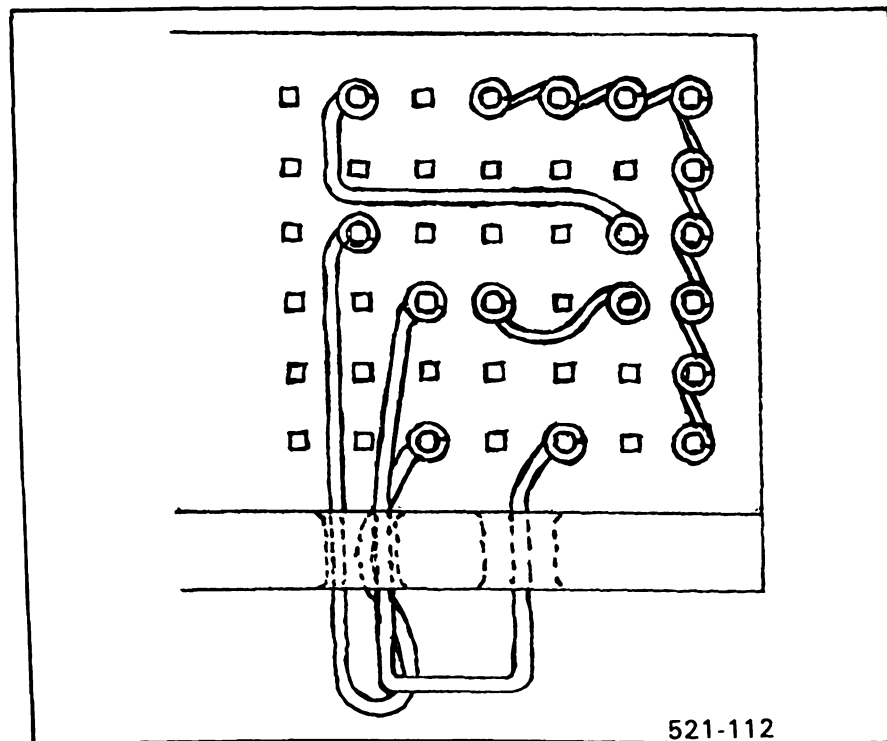


Figure 3. Strapping of Nonadjacent Wire Wrapped Terminals.

4. Perform Step 3 for all DTA straps to be installed.
5. Notify the supervisor that the DTA strapping has been completed.

REFERENCES

TM 11-2102, Installation Instructions, Step-by-Step Dial Central Office Equipment, Jun 50.

CCTM 105-50-21, Telecommunications Engineering - Installation Practices: (Installation - General), Mar 74.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 421, Installation of Dial Central Office Equipment.

Manufacturer's DTA drawings.

TASK

113-604-0061

Troubleshoot 600 Ohm and 900 Ohm Two-Wire to Four-Wire Telephone Repeater Terminating Units and Four-Wire to Four-Wire Voice Frequency Line Amplifiers

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. A 600 or 900 ohm two-wire or four-wire telephone repeater terminating unit and/or a four-wire to four-wire voice frequency line amplifier with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-101/G.
4. Oscilloscope Tektronix 561 with plug-in unit No. 3A72 dual trace or equivalent.
5. Telephone Test Meter Hewlett-Packard Model 3555B.
6. Vacuum Tube AC Voltmeter Hewlett-Packard 400L or equivalent.
7. Telephone Oscillator Hewlett-Packard Model 236A.
8. Multimeter Triplet Model 630NA or equivalent.
9. Test cord alligator clip to type 310 plug.
10. Capacitor Decade Box 0.01-0.015 mfd in 0.01 mfd steps.
11. Type 310 plug, 600 and 900 ohm terminations.

12. Spare terminating set housing* (WESCOM) and 600 and 900 ohm banana plug terminations.
13. Telephone Test Set Lenkurt 2600.
14. Card Extension Unit WESCOM Model 7201.

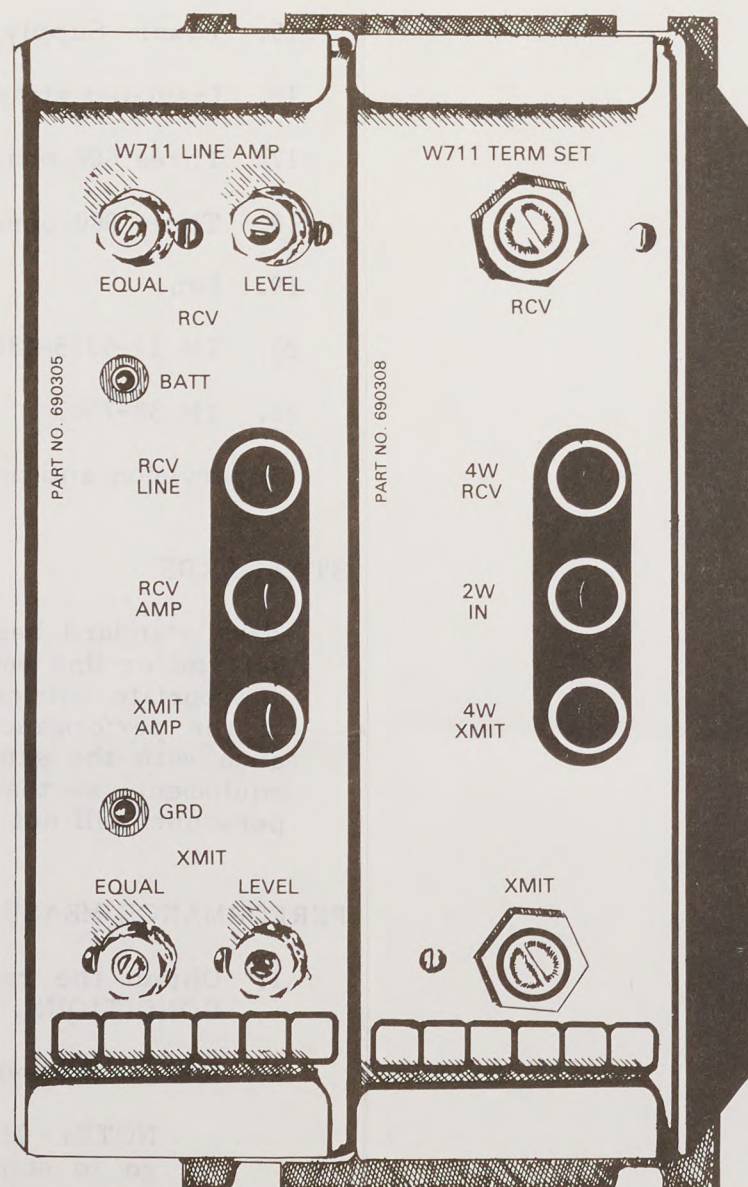


Figure 1. 600-Ohm Two-Wire to Four-Wire Telephone Repeater Terminating Unit FD-6000-AB and 900-Ohm Two-Wire to Four-Wire Telephone Repeater Terminating Unit FD-6000-AC.

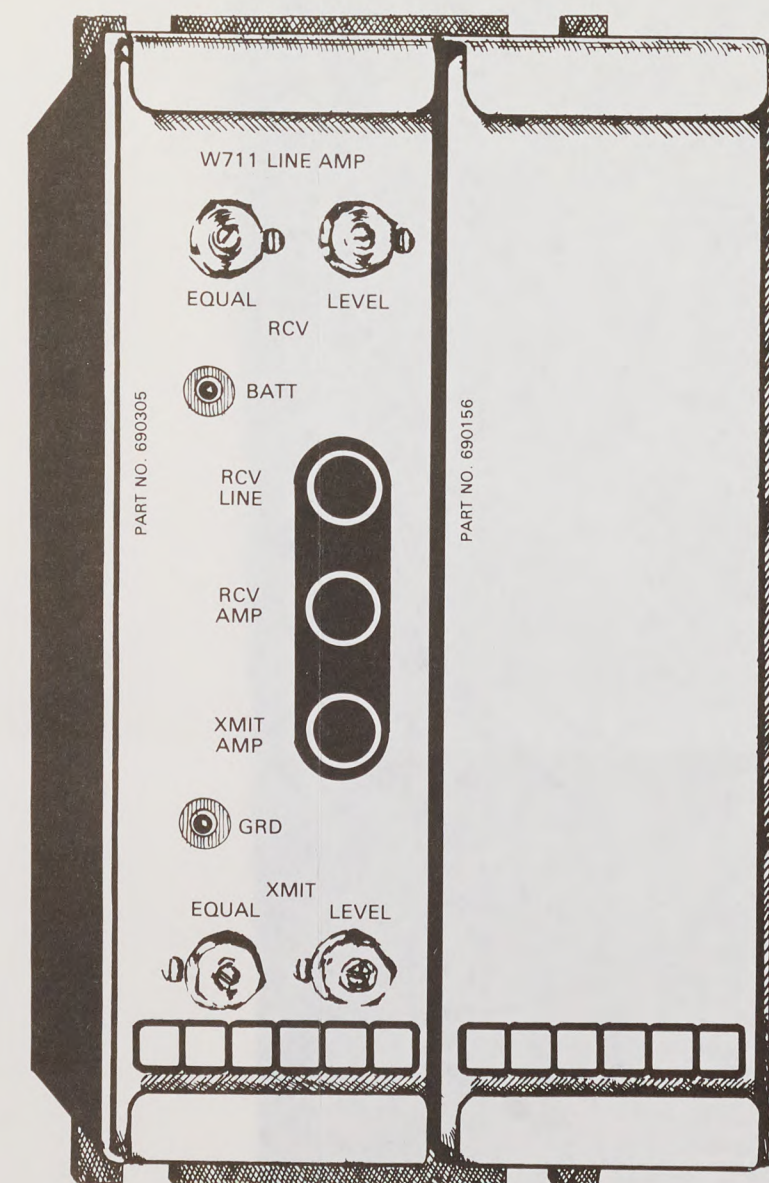


Figure 2. Four-Wire to Four-Wire Voice Frequency Line Amplifiers FD-6000-AG and FD-6000-AH.

SKILL LEVEL 1

15. Power Supply Harrison Laboratories Model 6439B or equivalent.
16. Insulated strap wire.
17. Three 600 ohm resistors (1/2 watt, $\pm 1\%$).
18. Three 900 ohm resistors (1/2 watt, $\pm 1\%$).
19. Pen.
20. TM 11-5805-482-15-1.
21. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the terminating set and/or line amplifier trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.

NOTE: If a vf line amplifier (single) is being examined, go to step 4. Sectionalization is unnecessary for a one component unit.

3. Sectionalize the trouble to the defective major component (W711 terminating set or W711 line amplifier) as follows:
 - a. Two-wire to four-wire 600 or 900 ohm terminating unit only. (Refer to TM 11-5805-482-15-1, para 5-13a(1), p 5-5.)

- b. VF line amplifier (dual) only. (Refer to TM 11-5805-482-15-1, para 5-13a(2), p 5-5.)

Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in step 2 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-5805-482-15-1, para 5-13b, 5-14c(1), or 5-14c(2), pp 5-5 thru 5-7.)

Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-5805-482-15-1, para 5-13c, 5-14c(1), or 5-14c(2), pp 5-5 thru 5-7; as applicable, para 5-14d and either 5-15 or 5-16, pp 5-8 thru 5-16.)

Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

Notify the supervisor that the defect has been located.

ENCES

11-5805-482-15-1, w/C1 and 2, Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool List: Overseas AUTOVON Interface Components: 600-Ohm and 900 Ohm, Two-Wire to Four-Wire Telephone Repeater Terminating Units and Four-Wire Voice Frequency Line Amplifier.

38-750, w/C1 and 2, The Army Maintenance Management System (AMMS), May 78.

TASK

113-604-0062

Troubleshoot 2600 Cycle Signaling Set with Self-Contained Oscillator

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. A 2600 cycle signaling set with self-contained oscillator with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-101/G.
4. Oscilloscope Tektronix 561 with Plug-In Unit No. 3A72 dual trace or equivalent.
5. Telephone Test Meter Hewlett-Packard Model 3555B.
6. Vacuum Tube AC Voltmeter Hewlett-Packard 400L or equivalent.
7. Telephone Oscillator Hewlett-Packard Model 236A.
8. Multimeter Triplet Model 630NA or equivalent.
9. Test cord alligator clip to type 310 plug.
10. Capacitor Decade Box 0.01-0.015 mfd in 0.01 mfd steps.
11. Type 310 plug, 600 ohm terminations.
12. Spare sf signaling set housing (WESCOM) and 600 ohm banana plug termination.
13. Signaling Test Set Model TTS-26B with Pulsing Panel Accessory Cover Model TTS-26BXPS.

14. SF Signal System Test Panel Model TTS-26BXPS.
15. AC Power Supply Model TTS-26BXPS.
16. Telephone Test Set Lenkurt 2600.
17. Card Extension Unit WESCOM Model 7210.
18. Power Supply Harrison Laboratories Model 6439B or equivalent.
19. Three 600 ohm resistors, 1/2 watt, $\pm 1\%$.
20. Pen.
21. TM 11-5805-482-15-2.
22. TM 38-750.

Supervision and assistance are available.

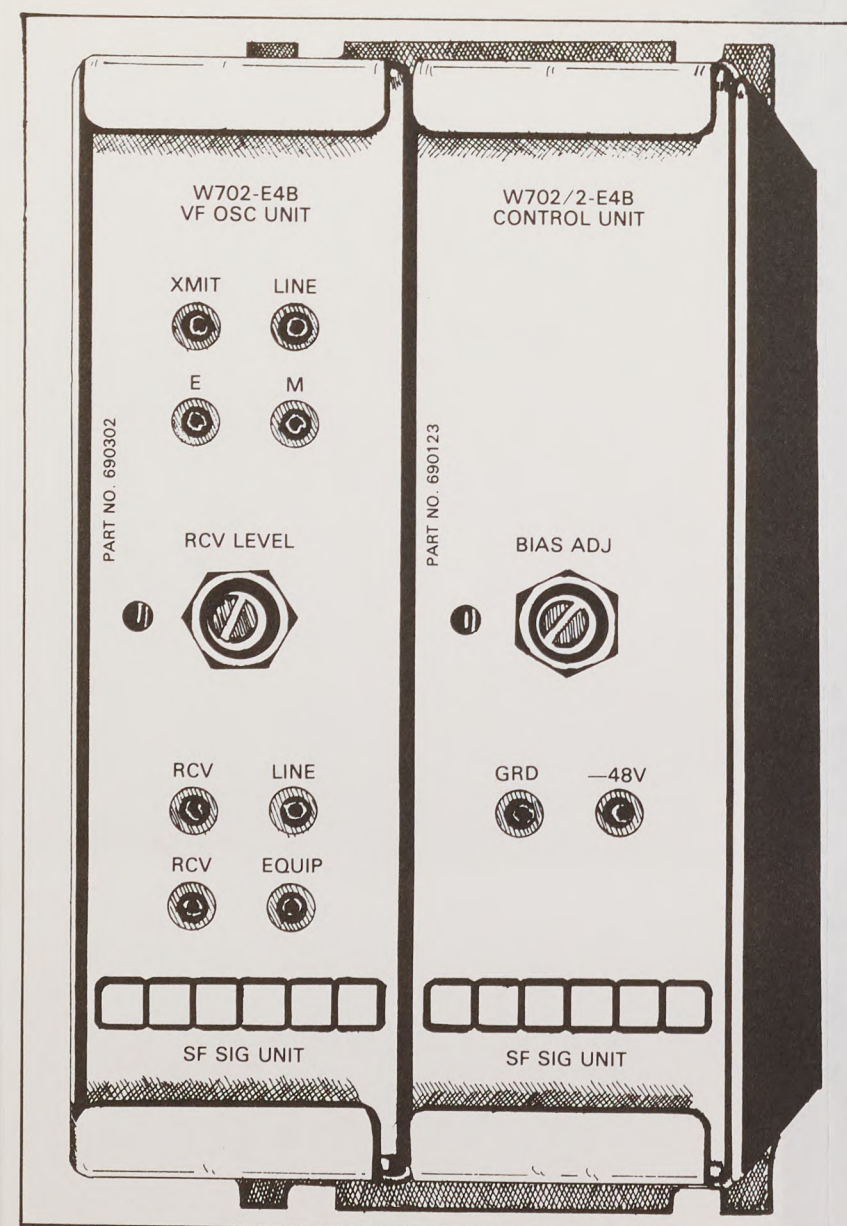


Figure 1. 2600-Cycle Signaling Set with Self-Contained Oscillator.

4. SF Signal System Test Panel Model TTS-26BXPS.
5. AC Power Supply Model TTS-26BXPS.
6. Telephone Test Set Lenkurt 2600.
7. Card Extension Unit WESCOM Model 7210.
8. Power Supply Harrison Laboratories Model 6439B or equivalent.
9. Three 600 ohm resistors, 1/2 watt, $\pm 1\%$.
0. Pen.
1. TM 11-5805-482-15-2.
2. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the signaling set trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the oscillator unit from the mounting assembly. (Refer to TM 11-5805-482-15-2, para 5-13a(1), p 5-4.)
4. Install an oscillator known to be serviceable on the mounting assembly. (Refer to TM 11-5805-482-15-2, para 5-13a(1), p 5-4.)
5. Make a test call through the sf signaling set. (If no trouble is encountered during the test call, the oscillator removed in step 3 is defective, if the trouble symptoms persist, the control unit is at fault.) (Refer to TM 11-5805-482-15-2, para 5-13a(1), p 5-4.)

NOTE: If the trouble is sectionalized to the oscillator removed in step 3, go to step 9.

6. Remove the control unit and the oscillator unit from the mounting assembly. (Refer to TM 11-5805-482-15-2, para 5-13a(2), p 5-4.)
7. Install a serviceable control unit on the mounting assembly. (Refer to TM 11-5805-482-15-2, para 5-13a(2), p 5-4.)
8. Reinstall the oscillator removed in step 3. (Refer to TM 11-5805-482-15-2, para 5-13a(2), p 5-4.)
9. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 5 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-5805-482-15-2, para 5-13b and 5-14c, pp 5-4 thru 5-7.)

0. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 9. (Refer to TM 11-5805-482-15-2, para 5-13b and 5-14c, pp 5-4 thru 5-7; as applicable, para 5-14d, pp 5-7 thru 5-16; figs 5-3 thru 5-11.)
1. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
2. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-482-15-2, w/C1 and 2, Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Overseas AUTOVON Interface Components: 2600 Cycle Signaling Set with Self-Contained Oscillator, Aug 69.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-604-0063

Troubleshoot DX Signaling Equipment and Repeating Coils

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

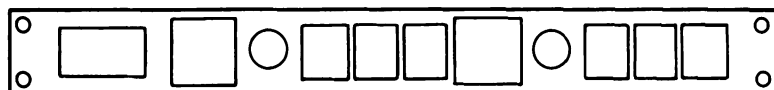
You will need:

1. DX signaling equipment and/or repeating coils with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-101/G.
4. Multimeter AN/USM-16 (or equivalent).
5. TM 11-5805-482-15-3.
6. TM 38-750.

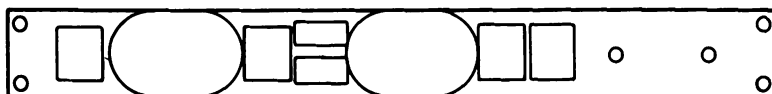
Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the DX signaling equipment and repeating coil trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment so that the equipment will not be damaged and maintenance personnel will not be injured.



A. DX SIGNALING EQUIPMENT
(TWO CIRCUITS PER ASSEMBLY)



B. REPEATING COILS (TWO CIRCUITS PER ASSEMBLY)

Figure 1. DX Signaling Equipment
and Repeating Coils.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.

NOTE: Before proceeding to step 3, insure that a circuit release has been obtained from the maintenance supervisor.

3. Remove the equipment from service.

4. Perform a resistance test of the four windings of each repeating coil. (Evaluation of the test readings will effectively sectionalize the trouble to one of the two repeating coils or to the DX signaling equipment.) (Refer to TM 11-5805-482-15-3, para 5-13a, p 5-3; para 5-14d(2), p 5-5.)
5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in step 2 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-5805-482-15-3, para 5-14c, p 5-5.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-5805-482-15-3, para 5-14c, p 5-5; para 5-13c, p 5-3.)
7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-482-15-3, W/C1 and 2, Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Overseas AUTOVON Interface Components: DX Signaling Equipment and Repeating Coils, Aug 69.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0057**

**Troubleshoot AUTOVON Two-Way PABX Routine
Trunk Circuit**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Two-way PABX routine trunk circuit with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-101/G.
4. Hand Test Telephone Automatic Electric Part Number L9066CF.
5. Repeat Coil 1:1.
6. Percent make meter (or equivalent).
7. Signal Generator Atlantic Research Part Number CSG-1-1.
8. Oscillator Hewlett-Packard Part Number 200CD.
9. Vacuum Tube Voltmeter Hewlett-Packard Part Number 400L.
10. Multimeter AN/USM-16 (or equivalent).
11. Pen.
12. TM 11-5805-482-15-4.
13. TM 38-750.

Supervision and assistance are available.

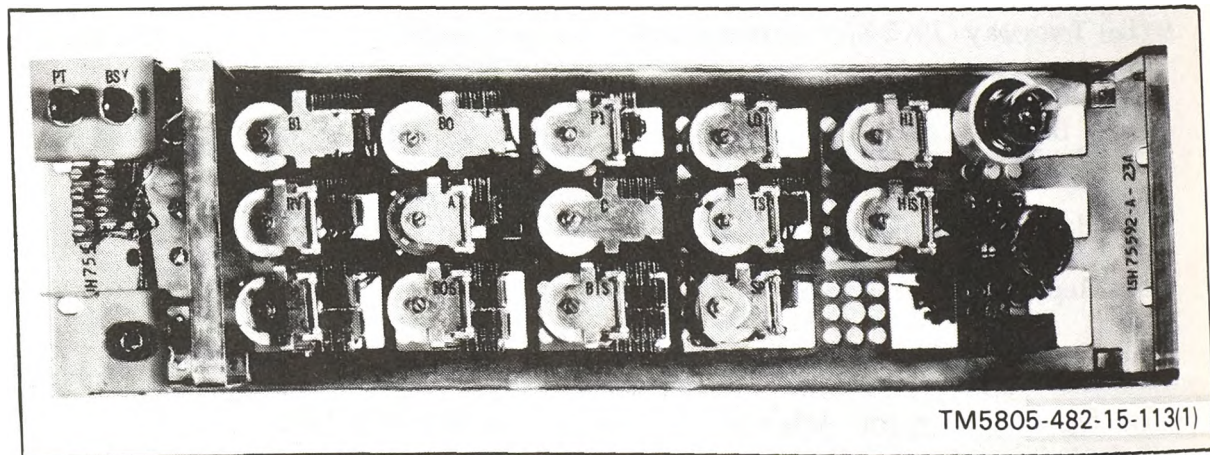


Figure 1. Typical Two-Way PABX Routine Trunk Circuit.

STANDARDS

Task standard has been completed when the causes of the AUTOVON two-way PABX routine trunk circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.

2. Review the symptoms listed in block 16 of the DA Form 2407.

NOTE: Before proceeding to step 3, insure that a circuit release has been obtained from the maintenance supervisor.

3. Remove the equipment from service.
4. Examine the circuit for defects that can be easily observed. (Refer to TM 11-5805-482-15-4, para 5-13a(1), p 5-4.)
5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in step 2 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-5805-482-15-4, para 5-14c, pp 5-5 thru 5-8.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-5805-482-15-4, para 5-13c, and 5-14c, pp 5-4 thru 5-8.)
7. Record the entries required in blocks 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-482-15-4, w/C1 and 2, Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Overseas AUTOVON Interface Components: Two-Way PABX Routing Trunk Circuit with Pad Control and Pulse Correction; Two-Way PABX Routine Trunk Circuit with Pad Control and Pulse Correction Circuit for Two-Way PABX Routine Trunk Circuit, Aug 69.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0046**

**Troubleshoot AUTOVON Two-Way PABX
Preemptible Interface Trunk Circuit**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

- Two-way PABX preemptible interface trunk circuit with suspected malfunction.
- DA Form 2407 with trouble symptoms listed in block 16.
- Tool Kit TK-101/G.
- AUTOVON cart-mounted test set.
- Hand test telephone.
- Repeat coil (1:1).
- Signal generator.
- Percent make meter (or equivalent).
- Oscillator.
- . Vacuum tube voltmeter.
- . Multimeter.
- . Pen.
- . TM 11-5805-482-15-5.
- . TM 38-750.

15. Assistance of a switchboard attendant and/or a subscriber.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the AUTOVON two-way PABX preemptible interface trunk circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.

2. Review the symptoms listed in block 16 of the DA Form 2407.

NOTE: Before proceeding to step 3, insure that a circuit release has been obtained from the maintenance supervisor.

3. Insure equipment has been removed from service.

4. Select the troubleshooting chart required by the type of adapter used in the system. Troubleshooting charts are available for the preemptible trunk circuit with pad control and pulse correction. (Refer to TM 11-5805-482-15-5, para 5-15c thru 5-21i, pp 5-17 thru 5-159.)

5. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in step 2 with those listed in the "symptom" column of the applicable troubleshooting chart. (Refer to TM 11-5805-482-15-5, para 5-15 thru 5-21, pp 5-17 thru 5-159.)

6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-5805-482-15-5, para 5-15 thru 5-21, pp 5-16 thru 5-159.)

7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-482-15-5, Operator's Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Overseas AUTOVON Interface Components: Two-Way PABX Preemptible Interface Trunk Circuit with Pad Control and Pulse Correction: Universal Cord Applique for Two-Way PABX Preemptible Interface Trunk Circuits; H75650 Trunk Circuit Adapter for AUTELCO Syst 1000/2, M819/427-A1; H75650 Trunk Circuit Adapter for AUTELCO Syst 1000/1, M819/427-A2; H75650 Trunk Circuit Adapter for Siemens RP40 SWBD, M819/427-B; H75650 Trunk Circuit Adapter for Siemens PABX EMD SWBD, M819/427-H; H75650 Trunk Circuit Adapter for Telenorma SWBD, M819/427-K H75650 Trunk Circuit Adapter for Siemen-Eisenbahn System, M819/427-N; Two-Way PABX Preemptible Interface Trunk Equipment; H75650 Trunk Circuit Adapter for British Post Office No. 3 System, Part No. M189/427-C; H75650 Trunk Circuit Adapter for Cordless Siemens BASA/60 Volt System, Part No. 654-132-01 and 654-132-02, Aug 69.

TM 38-750, w/C 1 and 2, The Army Maintenance Management Systems (TAMMS), May 78.

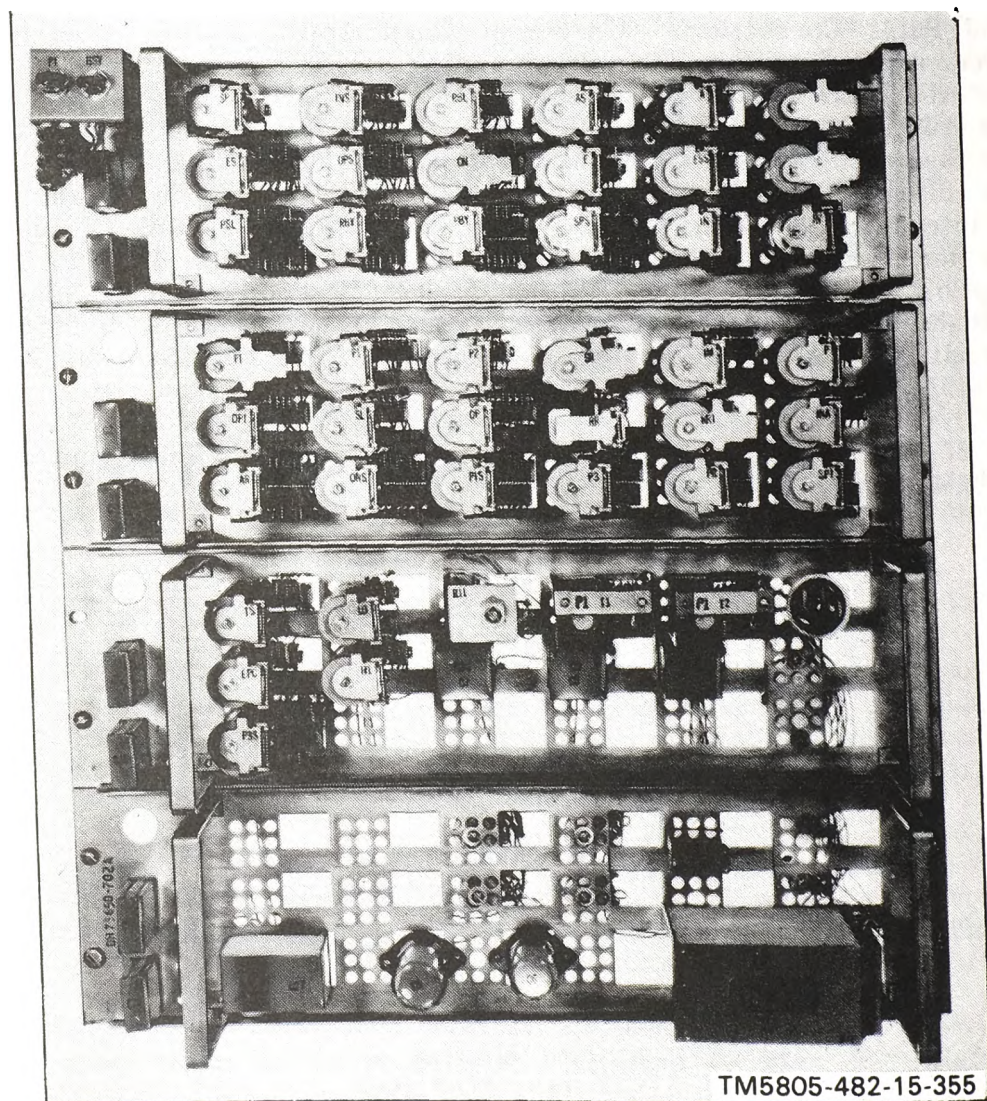


Figure 1. Typical Two-Way PABX Preemptible Interface Trunk Circuit with Pad Control and Pulse Correction

TASK**113-604-3028**

Perform Preventive Maintenance on Central Office Batteries

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. 48-Volt float charged battery system installed in a dial central office.
2. Tool Kit TK-87/U.
3. Multimeter TS-352B/U (or equivalent multimeter).
4. Safety gloves.
5. Safety goggles.
6. Rubber apron.
7. Vacuum cleaner.
8. Dust brush.
9. Dry, clean lint-free cloth.
10. Ammonia or baking soda.
11. Tap water.
12. Distilled water.
13. Trichloroethane (only if necessary).
14. NO-OX-ID grease.

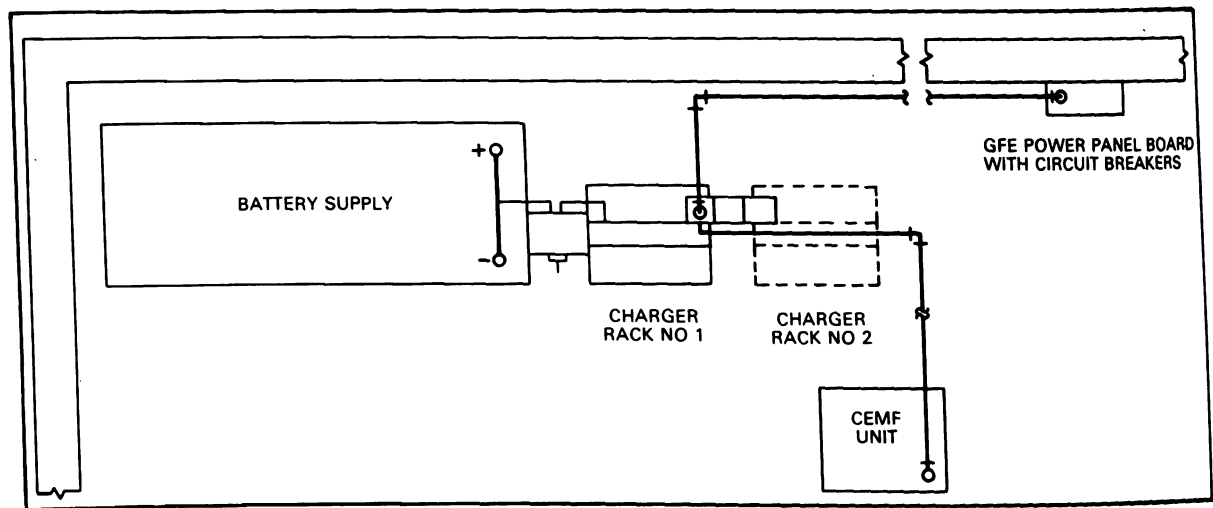


Figure 1. Typical Battery Plant Configuration.

15. Pen.
16. DA Form 2404.
17. DA Form 2407.
18. DA Form 4130.
19. DA Pam 310-4.
20. DA Pam 310-7.
21. TM 11-2103.
22. TM 11-5805-613-14.
23. TM 11-5805-621-14/4.
24. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when monthly, weekly, and daily preventive maintenance services, as required by the battery records, have been performed, and the applicable maintenance forms have been filled out, in accordance with the performance measures and the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.

WARNING: Wear protective rubber gloves, apron and goggles when working with or near the central office battery.

If trichloroethane is used for cleaning, provide thorough ventilation and allow no open flames. Trichloroethane fumes are toxic and convert to a highly toxic gas when exposed to an open flame.

2. Clean the battery and rack areas. (Refer to TM 11-5805-613-14, para 5-3c, and 5-3e(1) thru 5-3e(3), pp 5-1 and 5-2; and fig 1 below.)
3. Inspect the battery cells for visible defects. (Refer to TM 11-5805-613-14, para 5-3e(4), 5-3e(5), and 5-3e(7), p 5-2; TM 11-5805-621-14/4, para 4g, p 1-19, routine 1-20.)
4. Measure the following characteristics of the battery. (Refer to TM 11-5805-613-14, para 5-3e(6), 5-3e(8), and 5-3e(9), p 5-2; TM 11-5805-621-14/4, p 1-18, routine 1-19.)
 - a. Bus voltage.
 - b. Pilot cell hydrometer reading.
 - c. Pilot cell temperature.
 - d. Room temperature.
5. Calculate the temperature-corrected specific gravity of the pilot cell. (Refer to TM 11-5805-613-14, para 5-3e(8), p 5-2; TM 11-5805-621-14/4, p 1-18, routine 1-19(4d).)
6. Record the following items of information in the daily battery reading section of a locally produced form. (Refer to steps 4 and 5, and TM 11-5805-613-14, fig FO-1.)
 - a. Bus voltage.
 - b. Pilot cell hydrometer reading.
 - c. Pilot cell temperature.
 - d. Pilot cell temperature-corrected specific gravity.
7. Examine the following items of associated equipment for defects that can be observed easily. (Refer to TM 11-5805-613-14, para 5-3e(10) thru 5-3e(11), p 5-2.)
 - a. Local alarms.
 - b. Cabling.

NOTE: If weekly preventive maintenance checks and services are not to be performed, go to step 11; if neither weekly nor monthly preventive maintenance checks and services will be performed at this time, go to step 17.

8. Examine the indices of technical publications to determine whether the following items should be on hand and if those that are on hand are current. (Refer to DA Pam 310-4; DA Pam 310-7; TM 11-5805-613-14, para 5-3f(1) thru 5-3f(2), p 5-2.)
 - a. Central office battery technical manuals.
 - b. Central office battery modification work orders.
9. Examine the charger panel meters for deviations from the standard indications. (Refer to TM 11-5805-613-14, para 5-3f(3) thru 5-3f(4), p 5-2; TM 11-5805-621-14/4, pp 1-17 and 1-18, routine 1-18.)
10. Record the following items of information in the Pilot Cell Weekly Readings section of DA Form 4130. (Refer to steps 4 and 5, and fig 2 below.)
 - a. Pilot cell hydrometer reading.
 - b. Electrolyte temperature.
 - c. Temperature-corrected specific gravity.
 - d. Pilot cell voltage.

NOTE: If monthly preventive maintenance checks and services are not to be performed, go to step 17.

11. Measure the following characteristics of each cell in the battery. (Refer to TM 11-5805-613-14, para 5-3g(1) thru 5-3g(2), p 5-3; TM 11-5805-621-14/4, pp 1-18 thru 1-20, routine 1-20(4).)
 - a. Cell voltage.
 - b. Cell hydrometer reading.
 - c. Cell electrolyte temperature (required for only two cells in each row).

MONTHLY STORAGE BATTERY RECORD <small>For use of this form, see TM 11-2103; the proponent agency is United States Army Materiel Development & Readiness Command.</small>						1. POST				
NOTE: Send ORIGINAL to Army or Theater Signal Officer. Retain DUPLICATE in files of telephone exchange						2. FOR MONTH ENDING				
3. MFR. OF BATTERY				4. MFRS. TYPE		5. BATTERY NUMBER				
6. DATE INSTALLED										
PILOT CELL WEEKLY READINGS <small>(Read at same hour same day of each week)</small>					MONTHLY READINGS - ALL CELLS * <small>(Made on first Thursday of each month)</small>					
PILOT CELL NO.			TIME <div style="text-align: right;">A. M.</div>		CELL NO.	HYDROMETER READING OBSERVED SPEC. GRAV.	TEMP OF ELEC-TROLYTE	SPECIFIC GRAVITY CORRECTED TO °	INDIVIDUAL CELL VOLTAGE	REMARKS
1	2	3	4	5						
					1					
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					
					11					
					12					
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					20					
					21					
					22					
					23					
					24					
					25					
					26					
<p style="text-align: center;">NOTES</p> <p>1. FOLLOW MANUFACTURER'S INSTRUCTIONS IN ALL CASES, INCLUDING S. G. CORRECTION FOR BASIC TEMPERATURE.</p> <p>2. IF BATTERY IS EQUIPPED WITH CHARGE INDICATOR, OMIT WEEKLY PILOT CELL READINGS AND TAKE MONTHLY READINGS ONLY OF ALL CELLS, USING TEMPERATURE OF PILOT CELL FOR CORRECTIONS.</p> <p>3. TO CORRECT SPECIFIC GRAVITY READINGS FOR TEMPERATURE ADD .001 FOR EACH 3° ABOVE OR DEDUCT .001 FOR EACH 3° BELOW MANUFACTURER'S BASIC TEMPERATURE.</p> <p>4. WHEN REPORTING LEAD-CALCIUM GRID BATTERIES, ONLY RECORD HYDROMETER READINGS ON INDIVIDUAL CELLS ONCE EVERY SIX MONTHS. READINGS SHOULD BE MADE PRIOR TO EQUALIZING CHARGES.</p> <p>* REMARKS (Indicate cells which have been receiving special attention and reason therefor, also date rate of charge changed, etc.)</p>					<p style="text-align: right;">APPROVED (Signature of Recorder)</p> <p style="text-align: right;">OFFICER IN CHARGE AND GRADE</p>					

DA FORM 1 OCT 76 4130

REPLACES DA FORM 4130, 1 JUL 73, WHICH MAY BE USED UNTIL EXHAUSTED

Figure 2. Monthly Storage Battery Record (DA Form 4130)

2. Calculate the temperature-corrected specific gravity of each cell in the battery. (Refer to TM 11-5805-613-14, para 5-3g(1), p 5-3; TM 11-5805-621-14/4, p 1-18, routine 1-19(4g).)
3. Remove the pilot hydrometer from the cell in which it is located. (Refer to TM 11-5805-613-14, para 5-3g(3), p 5-3; TM 11-5805-621-14/4, pp 1-19 and 1-20, routine 1-20(4g).)
14. Install the pilot hydrometer in a different battery cell. (Refer to TM 11-5805-613-14, para 5-3g(3), p 5-3; TM 11-5805-621-14/4, pp 1-19 and 1-20, routine 1-20(4g).)
15. Examine the current limit setting of the chargers. (Refer to TM 11-5805-613-14, para 5-3g(4), 5-6b(6), pp 5-3 and 5-4.)
16. Record the following items of information in the Monthly Readings - All Cells section of DA Form 4130. (Refer to steps 11 and 12 and fig 2 below.)
 - a. Cell hydrometer reading.
 - b. Cell electrolyte temperature.
 - c. Temperature-corrected specific gravity of the cell.
 - d. Cell voltage.
 - e. Remarks (as required).
17. Clean, replace, repair or report all defects discovered in steps 2 thru 15.
18. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if major repairs are required. (Refer to TM 38-750, para 3-9c(1) thru 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)
19. Notify the supervisor that the preventive maintenance checks and services have been completed.

REFERENCES

DA Pam 310-4, Index of Technical Publications, Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.

DA Pam 310-7, Military Publications: US Army Equipment Index of Modification Work Orders.

TM 11-2103, w/C 1 and 2, Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment, Jun 50.

TM 11-5805-613-14, w/C1, Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List (Including Depot Repair Parts and Special Tools List): 48-Volt Battery System, Aug 72.

TM 11-5805-621-14/4, Operator, Organizational, Direct Support and General Support Maintenance Manual: XY Dial Telephone Central Office Equipment, Part 4 (Preventive Maintenance Instructions), Nov 71.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-604-2004

Perform Preliminary Starting Procedure for Scanner Groups OA-8746(V)1/GT or OA-8746(V)2/GT

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Telephone Traffic Scanner Group OA-8746(V)1/GT or OA-8746(V)2/GT installed in a dial central office.
2. Supervisor's instructions for placing the scanner in operation.
3. DA Form 2404.
4. Pen.
5. TM 11-5805-640-13.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the scanner has been put into operation in the mode required by either the supervisor or the operational environment, whichever applies. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required materials listed under CONDITIONS.

WARNING: Insure that the equipment is grounded before operating it.

2. Examine the scanner to insure that all controls are set at the preliminary settings. (Refer to TM 11-5805-640-13, para 2-8 thru 2-9, p 2-4, fig 1.)

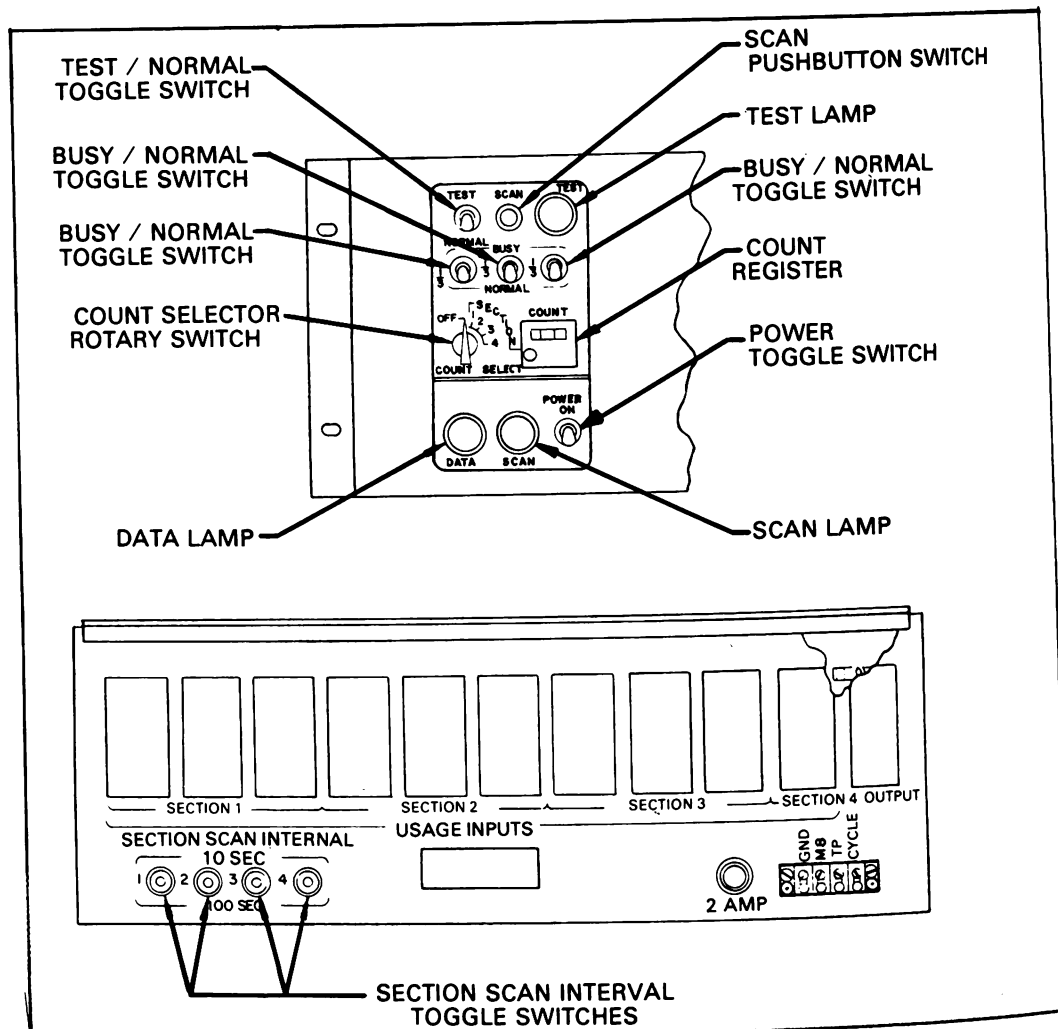


Figure 1. Operator's Controls and Instruments,
Telephone Traffic Scanner Groups
OA-8746(V)1/GT and OA-8746(V)2/GT

NOTE: In steps 3 through 7 the standards of normal equipment operation are presented in parentheses.

Set the POWER switch at ON. (Illumination of the SCAN indicator lamp demonstrates proper functioning.) (Refer to TM 11-5805-640-13, para 3-4a, p 3-2, fig 1.)

Check the TEST lamp. (Extinguished TEST lamp is normal. If the TEST lamp illuminates, one or more of the BUSY/NORMAL switches is set at BUSY. All BUSY/NORMAL switches will be set at NORMAL.) (Refer to TM 11-5805-640-13, para 3-4c, p 3-2, fig 1.)

- Set the four SECTION SCAN INTERVAL switches. (The switches will be set in accordance with the supervisor's instructions or local operational requirements.) (Refer to TM 11-5805-640-13, para 3-4d, p 3-2, fig 1.)
- Check the operation of the yellow SCAN lamp. (Continuous illumination of the yellow SCAN lamp indicates no scanning is occurring. Five-second on cycle and five-second off cycle of the SCAN lamp indicate that a scan is in progress.) (Refer to TM 11-5805-640-13, para 3-4e, p 3-2, fig 1.)
7. Check the operation of the DATA lamp. (Intermittent flickering of the green DATA lamp indicates normal data reception. Constant illumination or lack of illumination indicates trouble in the scanner or the input leads.) (Refer to TM 11-5805-640-13, para 3-4f, p 3-2, fig 1.)
8. Check the accuracy of totals received at the readout of the electronic register device. (Refer to TM 11-5805-640-13, para 3-4g, p 3-2, fig 1.)
9. Check the response of the scanner to 100-second time pulses. (Refer to TM 11-5805-640-13, para 3-4g, p 3-2, fig 1.)
10. Notify the supervisor that the required procedures have been performed.

REFERENCES

TM 11-5805-640-13, Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Scanner Groups, Telephone Traffic OA-8746(V)1/GT and OA-8746(V)2/GT, Sep 74.

TASK

113-604-0052

Troubleshoot Scanner Groups OA-8746(V)1/GT or OA-8746(V)2/GT

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Telephone traffic scanner group OA-8746(V)1/GT or OA-8746(V)2/GT with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-105/G.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Pen.
6. TM 11-5805-640-13.
7. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the scanner group trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

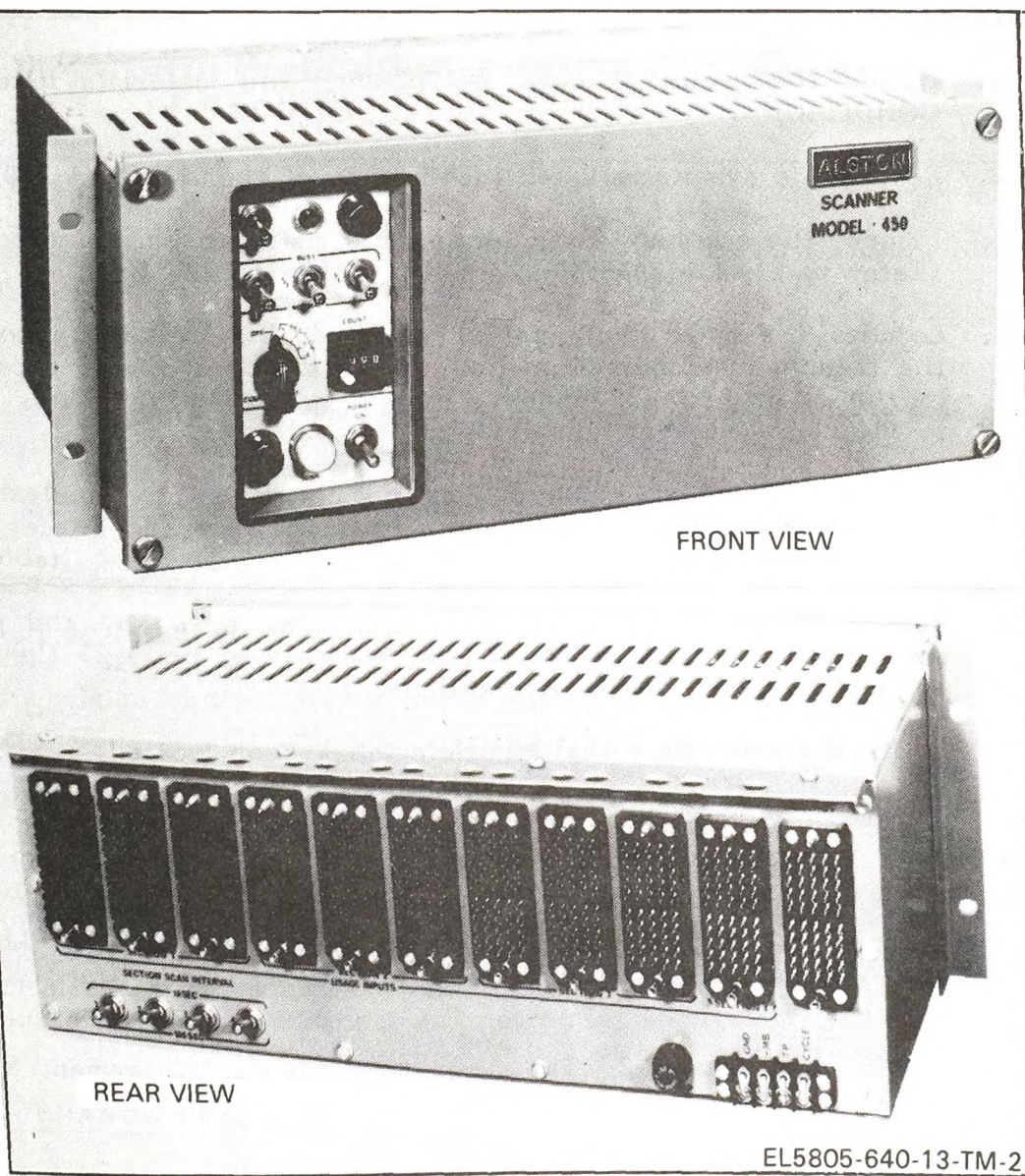


Figure 1. Telephone Traffic Scanner TA-917/GT
(Major Component of Telephone Traffic
Scanner Groups OA-8746(V)1/GT and
OA-8746(V)2/GT.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the scanner group for defects that can be observed easily. (Refer to TM 11-5805-640-13, p 4-2, table 4-2.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "malfunction" column of the troubleshooting chart. (Refer to TM 11-5805-640-13, pp 4-3 and 4-4, table 4-3.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-5805-640-13, para 4-6c thru 4-6d, pp 4-3 and 4-4, table 4-3.)
6. Record the entries required in column 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-640-13, Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Scanner Groups, Telephone Traffic OA-8746(V)1/GT and OA-8746(V)2/GT, Sep 74.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-2005**

**Perform Preliminary Starting Procedure for
Recorder Group OA-8744/GT**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Signal data recorder group OA-8744/GT installed in a dial central office.
2. Supervisor's instructions for placing the recorder into operation.
3. TM 11-5805-641-13.
4. TM 11-5805-643-13.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the recorder has been put into operation in the mode required by either the supervisor or the operational environment, whichever applies. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required materials listed under CONDITIONS.

WARNING: Insure that the equipment is grounded before operating it.

2. Examine the recorder to insure that all controls are set at the preliminary settings. (Refer to TM 11-5805-641-13, para 3-3, p 3-1; para 2-5 thru 2-11, pp 2-2 thru 2-6.)

NOTE: In steps 3 through 11 the standards of equipment and/or operator performance are presented in parentheses.

3. Set the POWER switch at ON. (Illumination of the POWER indicator lamp demonstrates proper functioning.) (Refer to TM 11-5805-641-13, para 3-4b, p 3-1.)
4. Set the SECONDS SELECT thumbwheel switch. (The switch will be set for the number of seconds required before the call selector times out, dropping the call and causing a printout.) (Refer to TM 11-5805-641-13, para 3-4c, p 3-2.)
5. Set the DIGIT SELECT thumbwheel switch. (The switch will be set for the number of dialed digits (1 to 14) expected in a normal, completed call. The call selector will drop any calls dialed with fewer than the number of digits set on the DIGIT SELECT switch.) (Refer to TM 11-5805-641-13, para 3-4d, p 3-2.)
6. Set the PRE-DIGIT ABSORB switch. (The switch will be set to absorb either two, one or none of the first dialed digits received, as required by local operations.) (Refer to TM 11-5805-641-13, para 3-4d, p 3-2.)
7. Set the FORMAT switch. (The switch will be set at either the 14-DIGIT, I.D., 12-DIGIT, or the HOLDING TIME and 12-DIGIT position, as required by local operations.) (Refer to TM 11-5805-641-13, para 3-4e, p 3-2.)
8. Set the MF switch. (The switch will be on for multifrequency calls or off for dial-pulse only calls.) (Refer to TM 11-5805-641-13, para 3-4f, p 3-2.)
9. Set the CS RELEASE switch. (The CS RELEASE switch setting will be coordinated with the C.S. RELEASE switch of the associated decoder group.) (Refer to TM 11-5805-641-13, para 3-4g, p 3-2; TM 11-5805-643-13, para 3-4b(8), p 3-3.)
10. Depress the PRINT push button.

NOTE: If the time and day on the printout correspond to the present time and day, go to step 12.

11. Set the electronic clock as follows:
 - a. Depress the RESET button. (This resets the clock to 12:00 PM, day 1.)
 - b. Depress the MIN ADV, the HR ADV and/or the DAY ADV button. (This advances beyond the time printed or beyond the reset time.) (The button(s) will be depressed as required until the proper day and time are obtained. Verification of the setting will be made by returning to step 10.) (Refer to TM 11-5805-641-13, para 3-5, p 3-2.)
12. Notify the supervisor that the required procedures have been performed.

REFERENCES

TM 11-5805-641-13, Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Recorder Group, Signal Data, OA-8744/GT, Sep 74.

TM 11-5805-643-13, Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools Lists: Decoder Group, OX-32/GT, Oct 74.

TASK

113-604-0053

Troubleshoot Recorder Group OA-8744/GT

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Signal Data Recorder Group OA-8744/GT with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-105/G.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Pen.
6. TM 11-5805-641-13.
7. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the recorder group trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

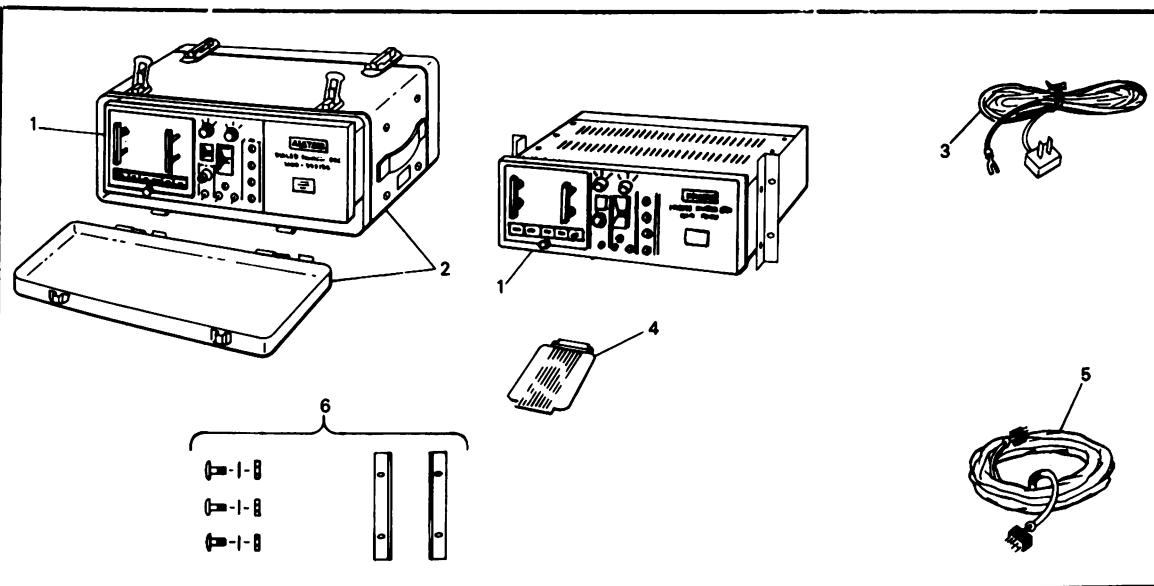


Figure 1. Signal Data Recorder Group OA-8744/GT.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the recorder group for defects that can be observed easily. (Refer to TM 11-5805-641-13, p 4-2, table 4-2.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "malfunction" column of the troubleshooting chart. (Refer to TM 11-5805-641-13, pp 4-4 and 4-5, table 4-3.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-5805-641-13, para 4-6c thru 4-6d, pp 4-3 thru 4-5, table 4-3.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-641-13, Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Recorder Group, Signal Data, OA-8744/GT, Sep 74.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-2006**

**Perform Preliminary Starting Procedure for Counter
Groups OA-8745(V)1/GT or OA-8745(V)2/GT**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Digital Counter Group OA-8745(V)1/GT or OA-8745(V)2/GT installed in a dial central office.
2. Supervisor's instructions for placing the counter into operation.
3. DA Form 2404.
4. Pen.
5. TM 11-5805-642-13.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the counter has been put into operation in the mode required by either the supervisor or the operational environment, whichever applies. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required materials listed under CONDITIONS.

WARNING: Insure that the equipment is grounded before operating it.

2. Examine the counter to insure that all controls are set at the preliminary settings. (Refer to TM 11-5805-642-13, para 3-3, p 3-2; para 2-13 and 2-14, p 2-7, fig 1 below.)

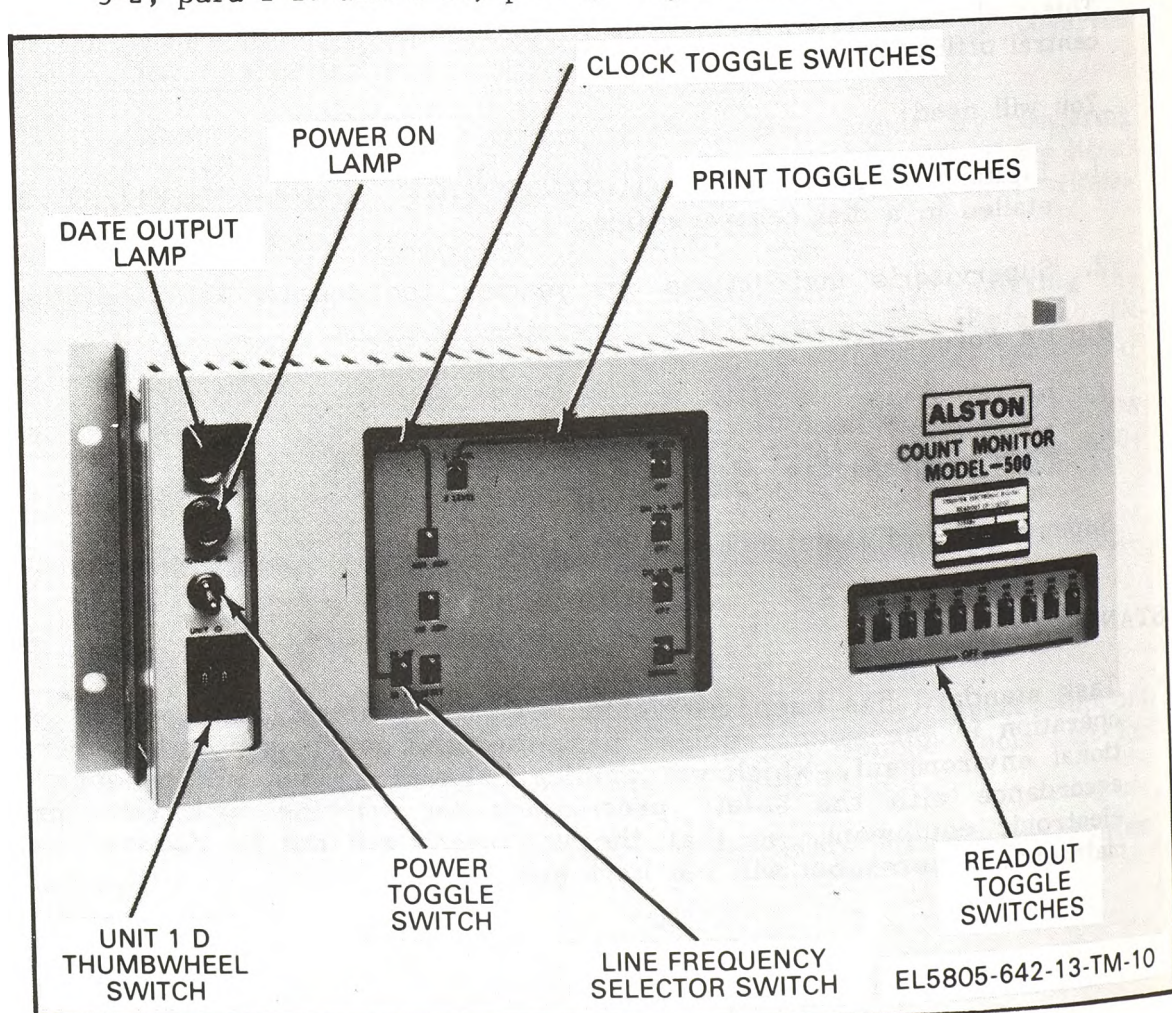


Figure 1. Operator's Controls and Instruments,
Digital Counter Group OA-8745(V)1/GT
or OA-8745(V)2/GT

NOTE: In steps 3 through 10 the standards of equipment and/or operator performance are presented in parentheses.

Set the POWER switch at ON. (Illumination of the POWER ON indicator lamp demonstrates proper functioning.) (Refer to TM 11-5805-642-13, para 3-4b thru 3-4c, p 3-2, fig 1.)

Set the 24-hour electronic clock. (Refer to TM 11-5805-642-13, para 3-4d, p 3-2.)

Momentarily depress and release the PRINT/MANUAL key. (Starting of the teletypewriter unit motor (if the MOTOR CONTROL terminals are connected or an idle line motor control is in use) and illumination of the DATA OUTPUT yellow indicator lamp during printout are indications of normal functioning. The printout which will normally result can be evaluated by comparison with the characteristics listed in TM 11-5805-642-13, paragraph 3-4e, page 3-3. (Refer to TM 11-5805-642-13, para 3-4d thru 3-4e, pp 3-2 and 3-3, fig 1.)

Depress and hold the PRINT/MANUAL key (if a header only is desired or if the printout of the selected registers is to be stopped). (The key will be held until a header has been printed, approximately five seconds.) (Refer to TM 11-5805-642-13, para 3-4f thru 3-4g, p 3-3, fig 1.)

a. Check the programing of the automatic periodic buffer transfer and inactive buffer printout. (Refer to TM 11-5805-642-13, para 3-4h, p 3-3, fig 1.)

b. Manual or remote polling of the counter.

Check the accuracy of register totals. (The accuracy of register totals from both buffer memories will be checked.) (Refer to TM 11-5805-642-13, para 3-4i, p 3-3, fig 1.)

Check the accuracy of buffer transfer and printout. (Performance will be compared with the programing.) (Refer to TM 11-5805-642-13, para 3-4i, p 3-3.)

Check the reception of time pulses by external scanners (if the external scanners are used). (Time pulses are produced at either 10 or 100 second intervals.) (Refer to TM 11-5805-642-13, para 3-4j, p 3-3.)

SKILL LEVEL 1

FM 11-36H1/2

10. Notify the supervisor that the required procedures have been performed.

REFERENCES

TM 11-5805-642-13, Operator's, Organizational, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools Lists) for Counter Groups, Digital OA-8745(V)1/GT and OA-8745(V)2/GT, Oct 74.

TASK**113-604-0054**

**Troubleshoot Counter Group OA-8745(V)1/GT or
OA-8745(V)2/GT**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Digital Counter Group OA-8745(V)1/GT or OA-8745(V)2/GT with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-105/G.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Pen.
6. TM 11-5805-642-13.
7. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the counter group trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

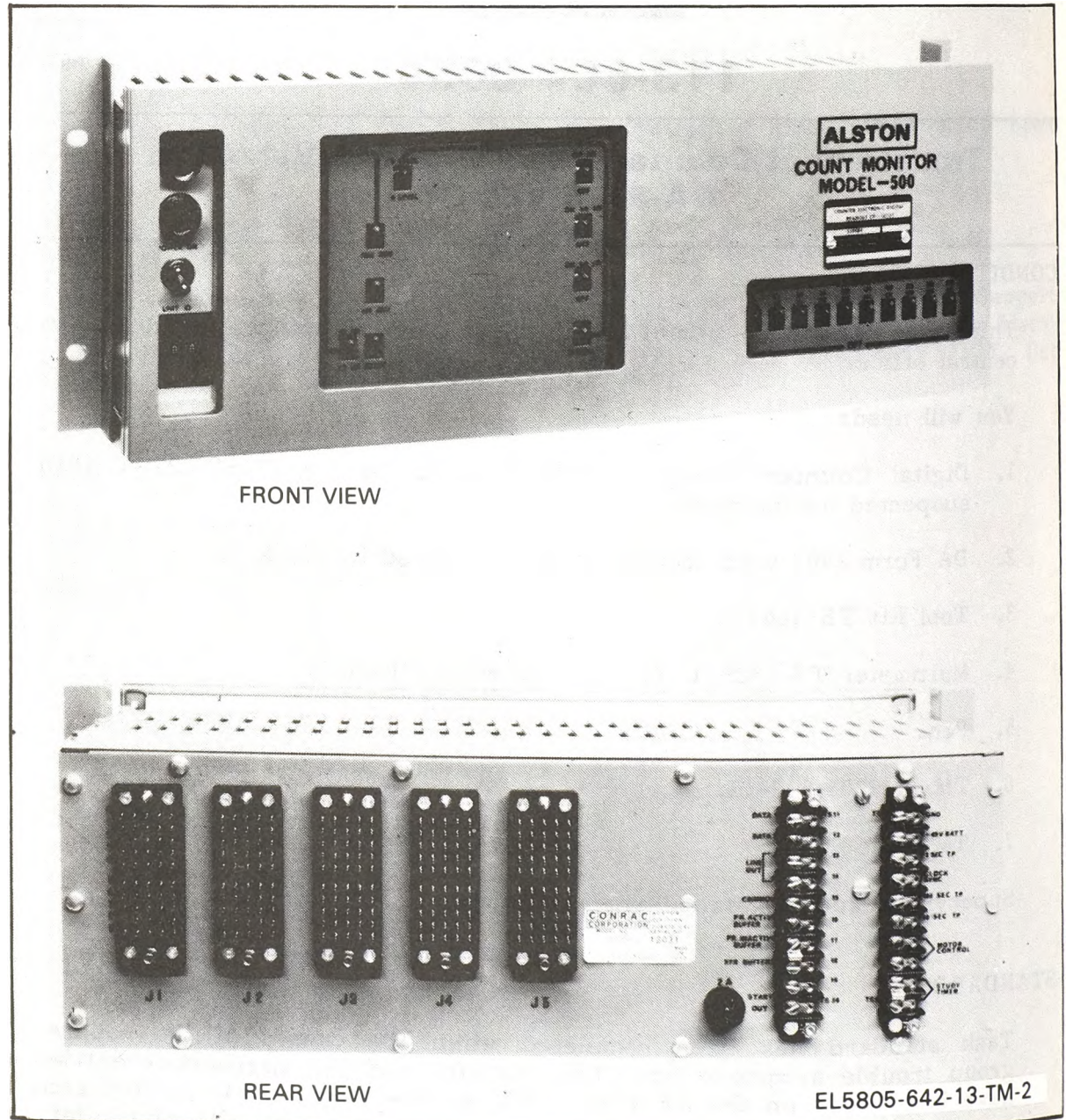


Figure 1. Digital Readout Electronic Counter
CP-1147/GT (Major Component of
Digital Counter Groups OA-8745(V)1/GT
and OA-8745(V)2/GT)

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the following areas of the counter group for defects that can be observed easily. (Refer to TM 11-5805-642-13, p 4-2, table 4-2.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "malfunction" column of the troubleshooting chart. (Refer to TM 11-5805-642-13, pp 4-4 and 4-5, table 4-3.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-5805-642-13, para 4-6c thru 4-6d, pp 4-3 thru 4-5, table 4-3.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-642-13, Operator's, Organizational, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools Lists) for Counter Groups, Digital OA-8745(V)1/GT and OA-8745(V)2/GT, Oct 74.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK

113-604-0055

Troubleshoot Decoder Group OX-32/GT

CONDITIONS

This task is normally performed in the controlled environment of a central office.

You will need:

1. Decoder Group OX-32/GT with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. Tool Kit TK-105/G.
4. Multimeter TS-352B/U (or equivalent multimeter).
5. Pen.
6. TM 11-5805-643-13.
7. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the decoder group trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.



Figure 1. Pulse Decoder Monitor KY-791/GT
(Major Component of Decoder Group OX-32/GT)

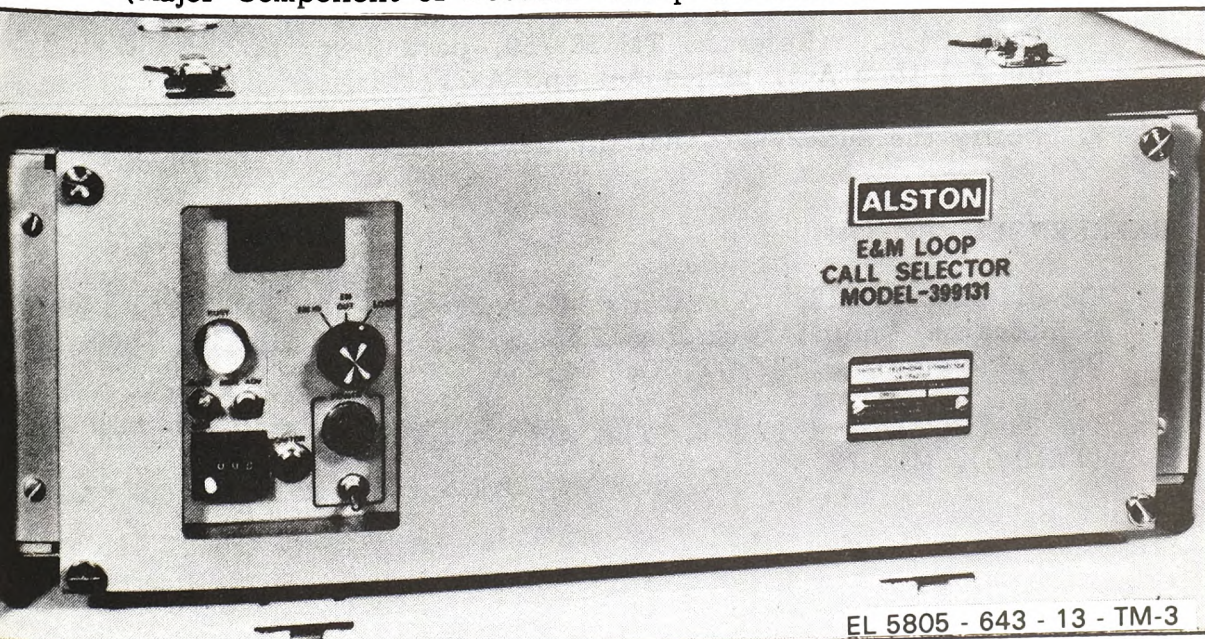


Figure 2. Telephone Connector Switch SA-1962/GT
(Major Component of Decoder Group OX-32/GT)

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Examine the decoder group for defects that can be observed easily. (Refer to TM 11-5805-643-13, p 4-3, table 4-2, seq 1 thru 3.)
4. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "malfunction" column of the troubleshooting chart. (Refer to TM 11-5805-643-13, pp 4-3 and 4-4, table 4-3.)
5. Isolate the defective part(s) or components(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-5805-643-13, para 4-6c thru 4-6d, pp 4-2 thru 4-4, table 4-3.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-5805-643-13, Operator's Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools Lists: Decoder Group, OX-32/GT, Oct 74.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TASK**113-604-0031**

**Troubleshoot XY Dial Central Office Power,
Ringing and Supervisory Equipment**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Item of supervisory, power or ringing and tone equipment installed in a 600-, 2000-, 4000-, or 5000-line XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Multimeter.
6. Pen.
7. TM 11-2118-15.
8. TM 11-2120.
9. TM 38-750.
10. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the power, ringing or supervisory equipment trouble symptoms have been isolated and

the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 thru 235.)

WARNING: If any selenium rectifiers burn out or arc-over, immediate ventilation will be provided to dissipate the poisonous fumes. The defective rectifier will not be handled until it has cooled.

Extreme caution will be used in troubleshooting the power panel and battery chargers to prevent the serious or fatal injuries which can result from contact with the 220 volt battery charger input circuit or the 110 volt circuits on the power board.

2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the unit showing trouble symptoms from service.
4. Inspect the malfunctioning item of equipment for defects that can be observed easily. (Refer to TM 11-2118-15, para 215c, p 220.)
5. Test the following types of equipment, as required by the kind of trouble present. (Refer to TM 11-2118-15, para 215d thru 217, pp 220 thru 224; manufacturer's schematic and wiring diagrams.)
6. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2, 4, and 5 with those listed in the "symptom" column of the appropriate troubleshooting chart from the following list:
 - a. Battery chargers PP-1044/GT, PP-1045/GT, and PP-1046/GT. (Refer to TM 11-2118-15, para 223, pp 225 thru 227.)
 - b. End-cell charger. (Refer to TM 11-2118-15, para 225, p 234.)
 - c. Charger control and battery discharge circuits. (Refer to TM 11-2118-15, para 226, pp 234 thru 235.)

- d. End-cell switches. (Refer to TM 11-2118-15, para 227, p 236.)
 - e. Voltage control circuit. (Refer to TM 11-2118-15, para 228, pp 237 and 238.)
 - f. Battery distribution circuit panels. (Refer to TM 11-2118-15, para 229, p 238.)
 - g. Ringing machine and control circuit. (Refer to TM 11-2118-15, para 230, pp 238 thru 240.)
 - h. Tone generator circuit. (Refer to TM 11-2118-15, para 232, pp 241 thru 244; para 234, pp 246 thru 249.)
 - i. Interrupter machine control circuit. (Refer to TM 11-2118-15, para 236, pp 252 and 253.)
 - j. Bay supervisory circuits. (Refer to TM 11-2118-15, para 237, pp 254)
 - k. Row supervisory circuits. (Refer to TM 11-2118-15, para 238, pp 255 and 256.)
 - l. Group supervisory circuit. (Refer to TM 11-2118-15, para 239, pp 257 and 258.)
 - m. Common supervisory circuit. (Refer to TM 11-2118-15, para 240, pp 258 thru 265.)
7. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 6. (Refer to step 6.)
 8. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
 9. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2118-15, XY Dial Central Office Equipment (Power, Ringing, and Supervisory Equipment), Oct 58.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 420, Dial Central Office Power Supervisory Equipment.

TASK**113-604-0032**

Troubleshoot XY Selector Circuit Plate

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Selector circuit plate installed in an XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Test lamp.
6. Hand test telephone.
7. Ohmmeter.
8. Pulsing limits test set.
9. Pulse speed and percent make test set.
10. XY switch test set.
11. Circuit plate maintenance test set.
12. Pen.
13. TM 11-2116.
14. TM 11-2120.

15. TM 38-750.

16. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the selector circuit plate trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 and 235.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the selector's busy switch on the make busy and test unit assembly. (Refer to fig 1 or 2.)
4. Inspect the circuit plate for defects that can be observed easily. (Refer to TM 11-2116, para 205, p 296.)
5. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the appropriate troubleshooting chart. (Refer to TM 11-2116, para 210 and 211, pp 308 thru 313.)
6. Isolate the defective part(s) or components(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2116, para 210 and 211, pp 308 thru 313.)
7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

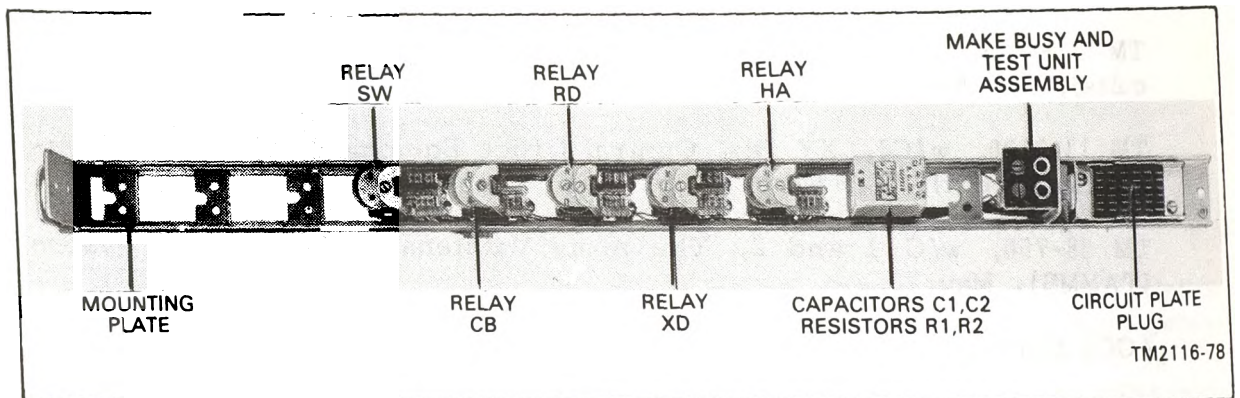


Figure 1. XY Dial Central Office Selector Circuit Plate, Nondigit-Canceling (Front View).

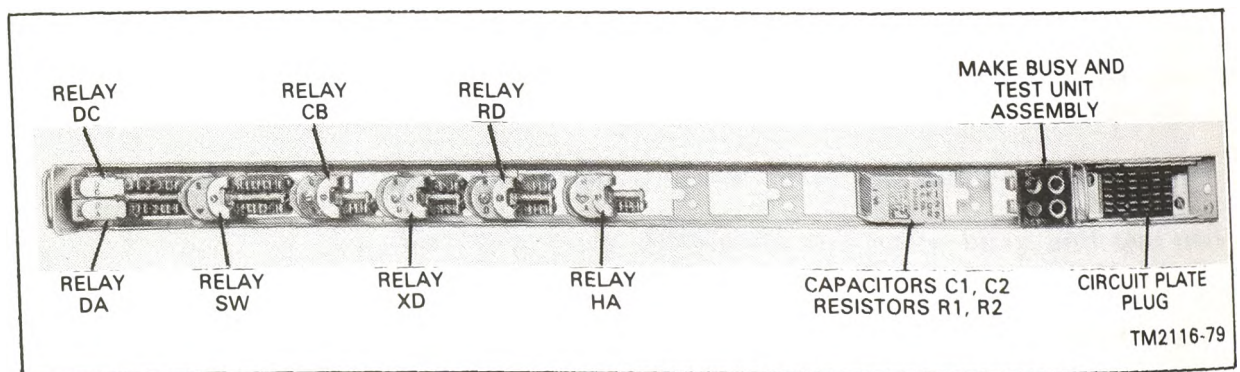


Figure 2. XY Dial Central Office Selector Circuit Plate, Digit-Canceling (Front View).

TASK**113-604-0033****Troubleshoot XY Connector Circuit Plate****CONDITIONS**

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. XY connector circuit plate with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Test lamp.
6. Hand test telephone.
7. Ohmmeter.
8. Pulsing limits test set.
9. Pulse speed and percent make test set.
10. XY switch test set.
11. Circuit plate maintenance test set.
12. Pen.
13. TM 11-2116.
14. TM 11-2120.
15. TM 38-750.

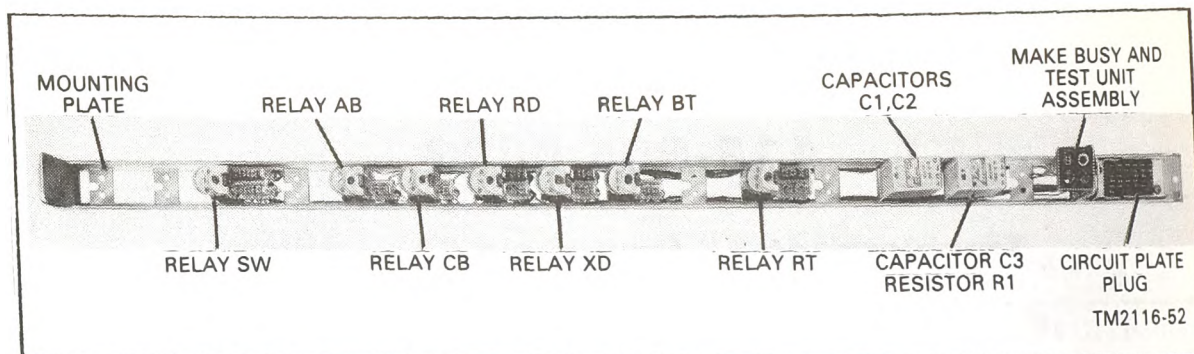


Figure 1. XY PX Connector Circuit Plate (Front View).

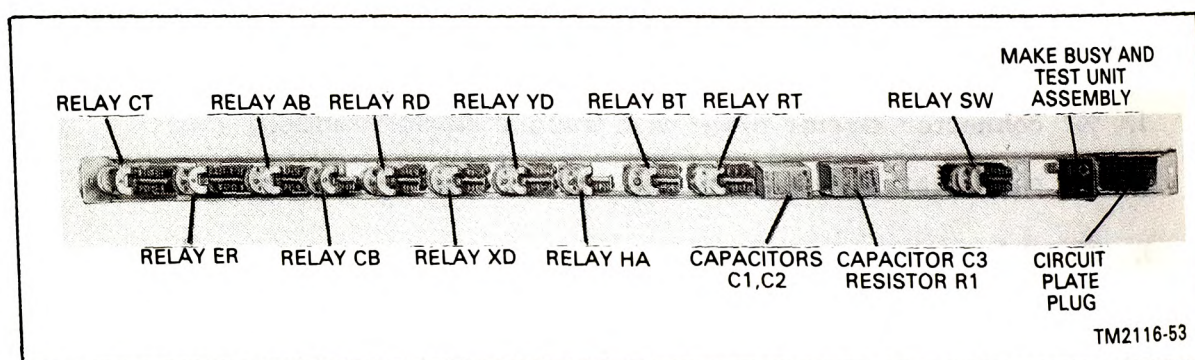


Figure 2. XY PBX Connector Circuit Plate (Front View).

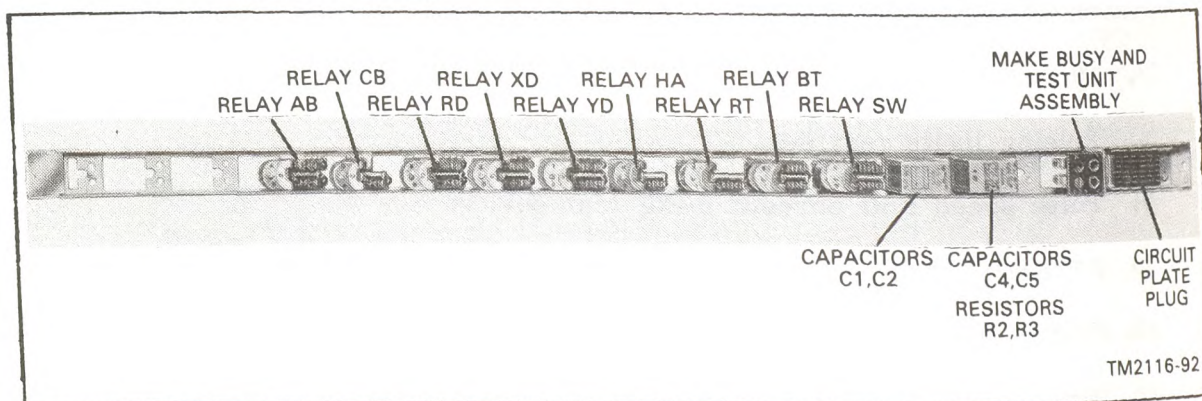


Figure 3. Individual or Trunk Hunting Connector Circuit Plate (Front View).

16. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the connector circuit plate trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the connector's busy switch on the make busy and test unit assembly (fig 1, 2, or 3.)
4. Inspect the circuit plate for defects that can be observed easily. (Refer to TM 11-2116, para 205, p 296.)
5. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the appropriate troubleshooting chart from the following list:
 - a. XY PX connector. (Refer to TM 11-2116, para 208, pp 301 thru 304.)
 - b. XY PBX connector. (Refer to TM 11-2116, para 209, pp 304 thru 308.)
 - c. Individual line connector. (Refer to TM 11-2116, para 212, pp 313 thru 316.)
 - d. Individual or trunk hunting connector. (Refer to TM 11-2116, para 213, pp 316 thru 319.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to step 5.)

7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK**113-604-0034**

Troubleshoot XY Allotter Circuit Plate

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Allotter circuit plate installed in an XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Test lamp.
6. Hand test telephone.
7. Ohmmeter.
8. Pulsing limits test set.
9. Pulse speed and percent make test set.
10. XY switch test set.
11. Circuit plate maintenance test set.
12. Buzzer.
13. Pen.
14. TM 11-2116.

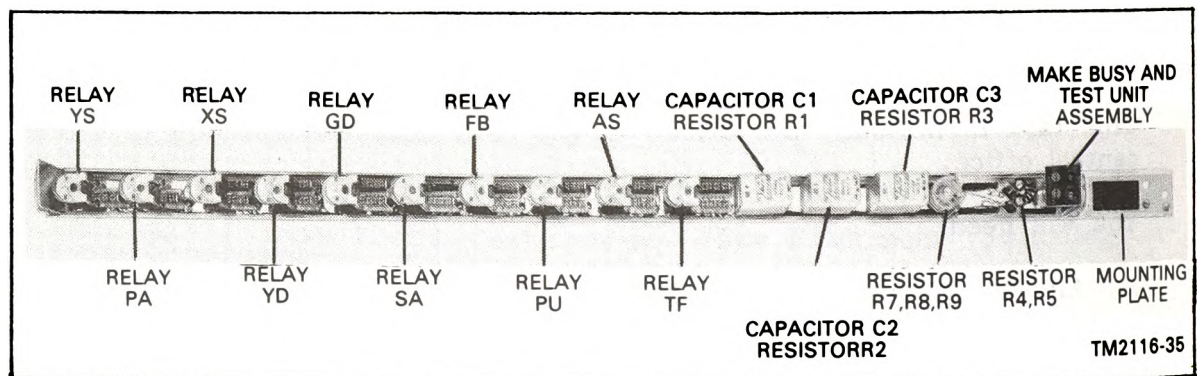


Figure 1. XY Dial Central Office Allotter Circuit Plate

15. TM 11-2120.
16. TM 38-750.
17. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the allotter circuit plate trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the allotter's busy switch on the make busy and test unit assembly (fig 1.)
4. Inspect the circuit plate for defects that can be observed easily. (Refer to TM 11-2116, para 205, p 296.)
5. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 2 and 4 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2116, para 207, pp 297 thru 301.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2116, para 207, pp 297 thru 301.)
7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)

FM 11-36H1/2

8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK**113-604-0035**

**Troubleshoot XY Linefinder Supervisory
Circuit Plate**

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Linefinder-connector bay supervisory circuit installed in an XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Test lamp.
6. Hand test telephone.
7. Ohmmeter.
8. Pen.
9. TM 11-2118-15.
10. TM 11-2120.
11. TM 38-750.
12. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

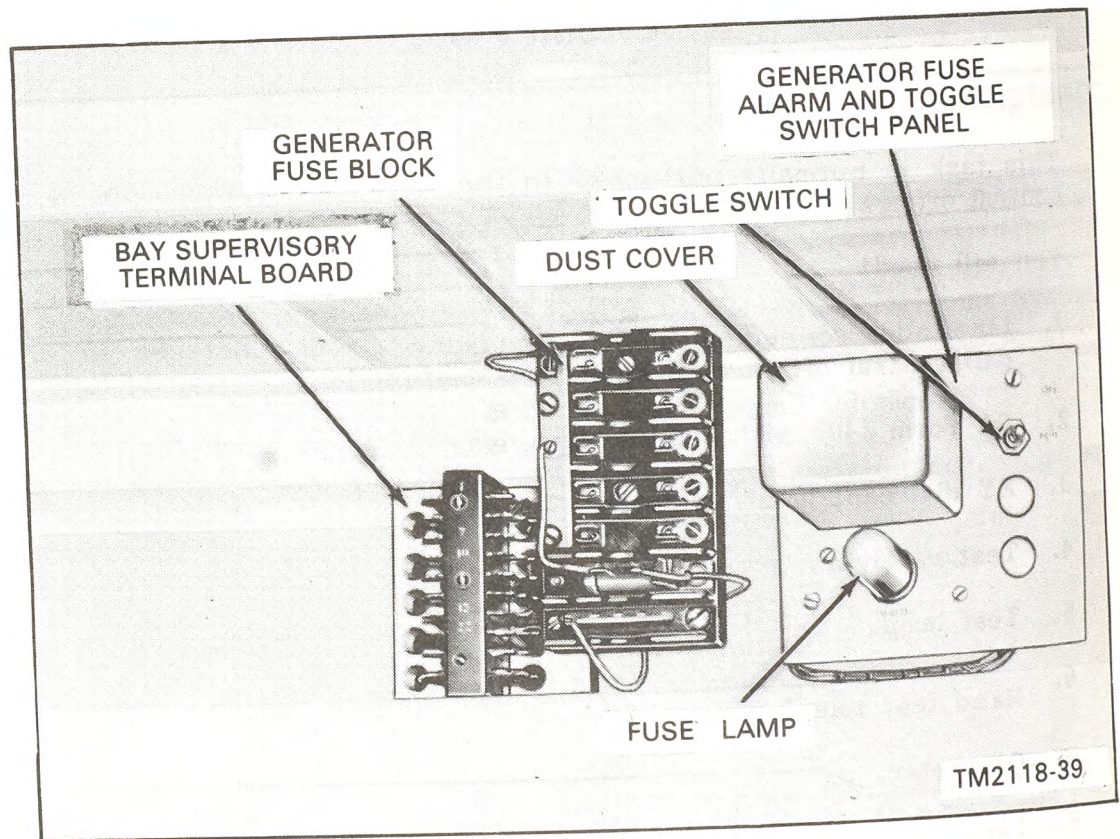


Figure 1. Typical XY Linefinder-Connector Bay Supervisory Equipment (Rear View)

STANDARDS

Task standard has been completed when the causes of the linefinder-connector bay supervisory circuit trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 and 235.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Inspect the circuit for defects that can be observed easily. (Refer to TM 11-2118-15, para 215c, p 220.)
4. Localize the most likely set(s) of "probable trouble" by comparing the trouble symptoms identified in steps 2 and 3 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2118-15, para 237a, p 254.)
5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 4. (Refer to TM 11-2118-15, para 237a, p 254.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2118-15, XY Dial Central Office Equipment (Power, Ringing, and Supervisory Equipment), Oct 58.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

ACCP Subcourse SSO 420, Dial Central Office Power and Supervisory Equipment.

TASK**113-604-0036**

Troubleshoot XY Linefinder Circuit Plate

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Linefinder circuit plate installed in an XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. Test receiver.
5. Test lamp.
6. Hand test telephone.
7. Ohmmeter.
8. Pen.
9. TM 11-2116.
10. TM 11-2120.
11. TM 38-750.
12. Manufacturer's schematic and wiring diagrams.

Supervision and assistance are available.

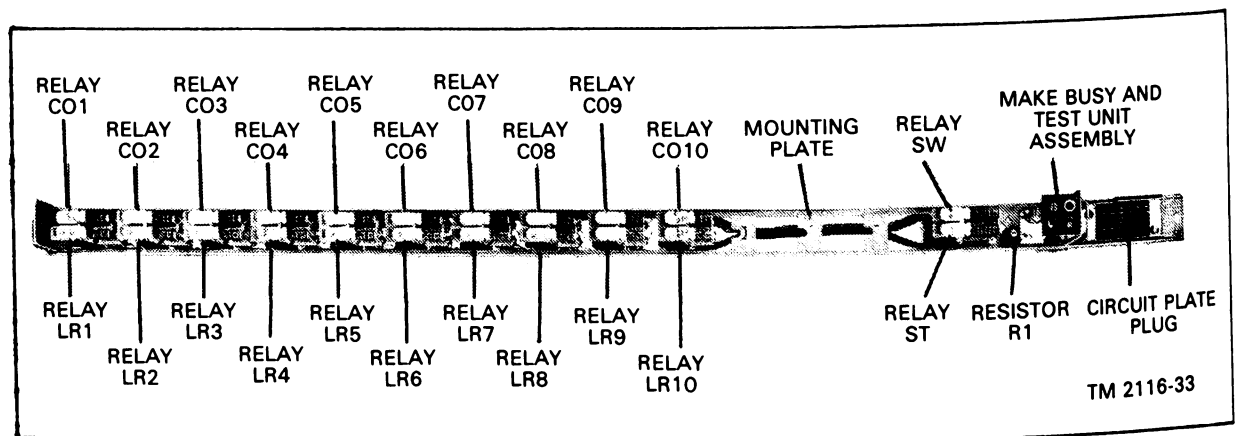


Figure 1. XY Dial Central Office Linefinder Circuit Plate
(Front View)

STANDARDS

Task standard has been completed when the causes of the linefinder circuit plate trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 and 235.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Operate the linefinder's busy switch on the make busy and test unit assembly (fig 1.)
4. Examine the following areas of the circuit plate for defects that can be observed easily. (Refer to TM 11-2116, para 205, p 296.)
5. Localize the most likely set(s) of "probable cause" by comparing the trouble symptoms identified in steps 1 and 4 with those listed in the "symptom" column of the troubleshooting chart. (Refer to TM 11-2116, para 207, pp 297 thru 301.)
6. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified in step 5. (Refer to TM 11-2116, para 207, pp 297 thru 301.)
7. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
8. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and testing Equipment), Mar 57.

SKILL LEVEL 1

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK**113-604-0037****Troubleshoot XY Switch****CONDITIONS**

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. XY switch installed in an XY dial central office with suspected malfunction.
2. DA Form 2407 with trouble symptoms listed in block 16.
3. XY dial central office tools.
4. XY switch test set.
5. Pen.
6. TM 11-2116.
7. TM 11-2120.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the causes of the XY switch trouble symptoms have been isolated and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

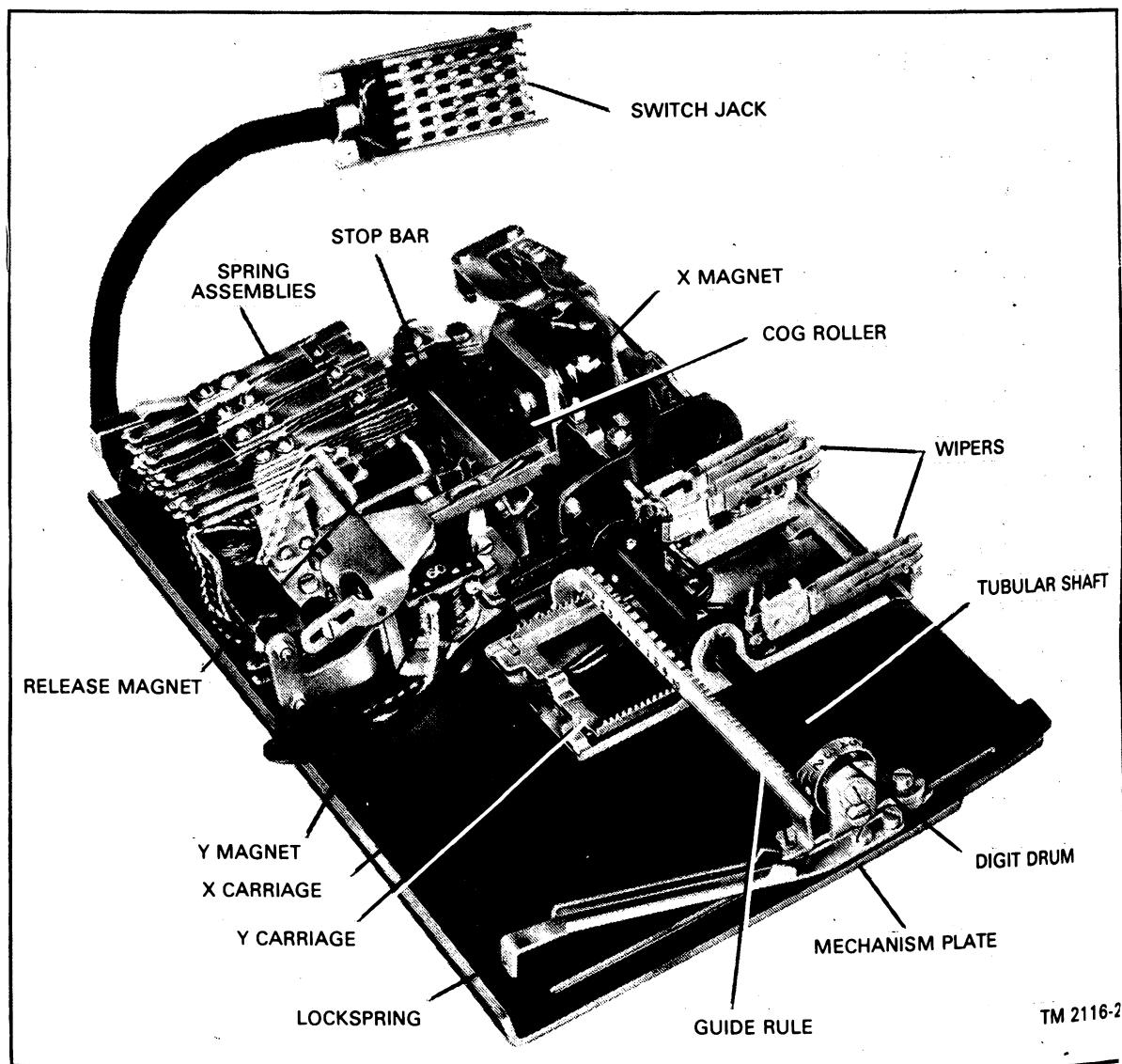


Figure 1. XY Switch

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2116, para 203, p 296; TM 11-2120, para 262, pp 234 and 235.)
2. Review the symptoms listed in block 16 of the DA Form 2407.
3. Remove the XY switch from service by operating make busy switch or associated circuit plate.
4. Inspect the XY switch for defects that can be observed easily. (Refer to TM 11-2116, para 205, p 296.)

NOTE: The trouble will have been localized to the XY switch in the troubleshooting task for the equipment with which the XY switch is associated (linefinder circuit plate, connector circuit plate, allotter circuit plate, etc.). The localization procedure will have identified one or more sets of probable causes of trouble symptoms.

5. Isolate the defective part(s) or component(s) by analyzing the sources of probable trouble identified previously. (Refer to TM 11-2116, para 207, pp 297 thru 299, items 5 thru 13.)
6. Record the entries required in columns 20b, e, g, h, and j of DA Form 2407. (Refer to TM 38-750, para 3-9c, pp 3-28 thru 3-30; pp A-1 thru A-6, tables A-1 and A-2.)
7. Notify the supervisor that the defect has been located.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 38-750, w/C1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 417, XY Dial Central Office Equipment.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

TASK

113-604-4036

Repair X Y Switch

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. Defective XY switch.
2. DA Form 2407 with the XY switch defects listed in block 20.
3. Serviceable part(s) or component(s) to replace the defective item(s).
4. XY dial central office tools.
5. XY switch test set.
6. 48 volt DC power source.
7. TM 11-2116.
8. TM 11-2120.
9. TM 11-5805-612-14/1/2.
10. TM 38-750.
11. TB SIG 222.

Supervision and assistance are available.

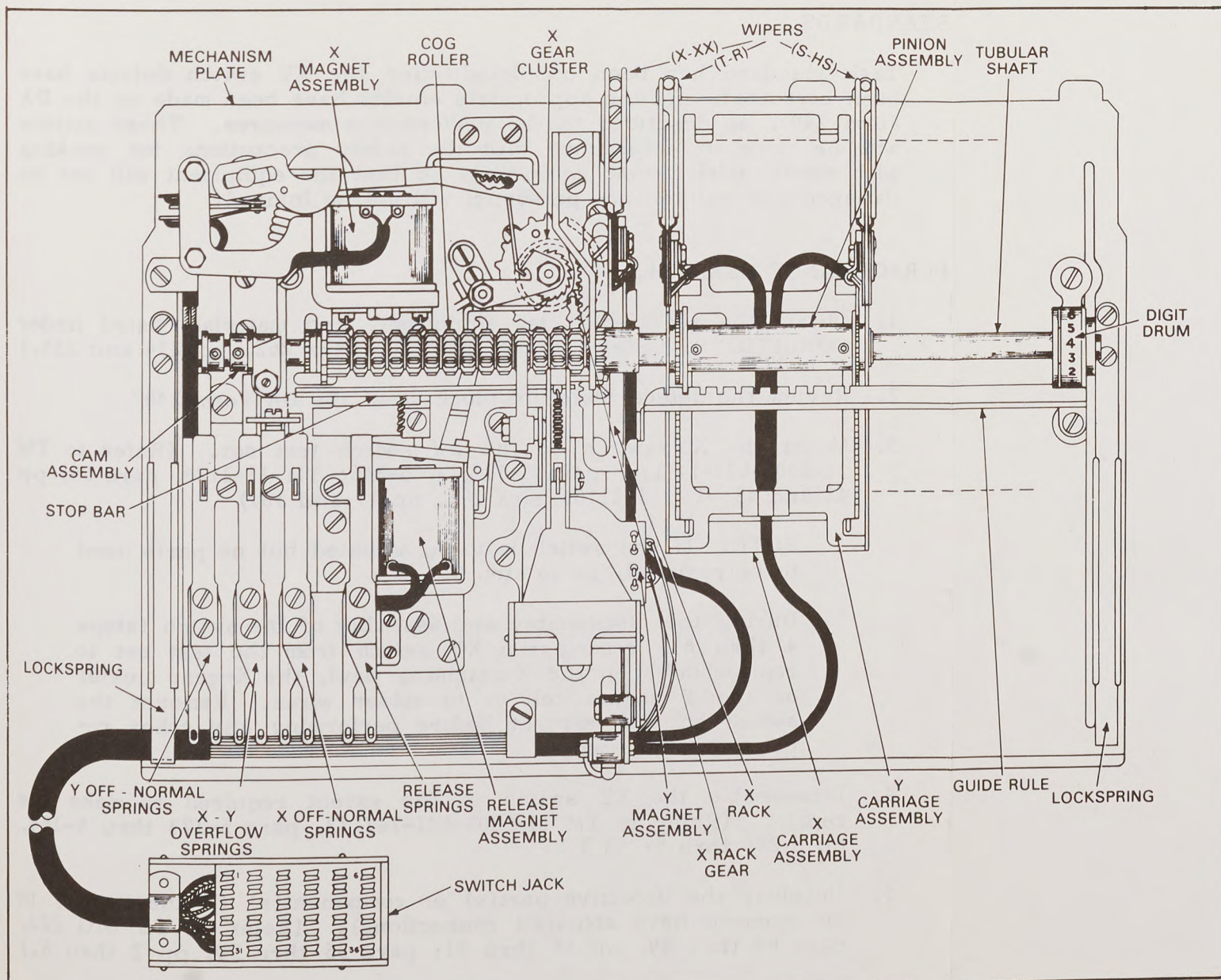


Figure 1. XY Switch

SKILL LEVEL 1

STANDARDS

Task standard has been completed when the XY switch defects have been corrected, and the appropriate entries have been made on the DA Form 2407, as described in the performance measures. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS. (Refer to TM 11-2120, para 262, pp 234 and 235.)
2. Review the defects listed in block 20 of the DA Form 2407.
3. Mount the XY switch on the XY switch test set. (Refer to TM 11-5805-621-14/1/2, para 5-174, p 5-246; TM 11-2120, para 65, pp 42 and 43; TM 11-2116, para 10c, pp 17 and 18.)

NOTE: If the switch is to be adjusted but no parts need to be replaced, go to step 9.

During the disassembly and assembly of the switch (steps 4 thru 8), remove the XY switch from the test set to replace bolts on the X-retaining pawl, the X-gear cluster or the Y-magnet coil or to solder wires. Remount the switch on the test set before performing any other repairs or adjustments.

4. Disassemble the XY switch to the extent required to make the repair. (Refer to TM 11-5805-621-14/1/2, para 5-173 thru 5-184, pp 5-246 thru 5-253.)
5. Unsolder the defective part(s) or component(s) (if the item(s) to be removed have soldered connections). (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 59, pp 2 thru 6.)
6. Replace or repair the defective part(s) or component(s), depending on the kind of defect(s) to be corrected. (Refer to TM 11-5805-621-14/1/2, para 5-173 thru 5-184, pp 5-246 thru 5-253.)
7. Solder any connections requiring soldering. (Refer to TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 71, pp 2 thru 16.)

8. Reassemble the XY switch. (Refer to TM 11-5805-621-14/1/2, para 5-173 thru 5-184, pp 5-246 thru 5-253.)
9. Adjust the XY switch. (Refer to TM 11-5805-621-14/1/2, para 5-195 thru 5-206, pp 5-254 thru 5-270.)
10. Record the entries required in columns 20a and 20g of DA Form 2407. (Refer to TM 38-750, para 3-9c, p 3-28; p A-7, table A-5.)
11. Notify the supervisor that the defect has been corrected.

REFERENCES

TM 11-2116, w/C1, XY Dial Central Office Equipment (Switching Circuits), Dec 55.

TM 11-2120, w/C1, XY Dial Central Office Equipment (Tools and Testing Equipment), Mar 57.

TM 11-5805-621-14/1/2, Operator, Organizational, Direct Support, and General Support Maintenance Manual: XY Dial Telephone Central Office Equipment, Part 1, Volume 2, (Maintenance Instructions), Nov 71.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

ACCP Subcourse SSO 425, XY Dial Central Office Repair.

TASK

113-574-2006

Perform Final Testing of an XY Switch Using the XY Switch Test Set 10E

CONDITIONS

This task is normally performed in the controlled environment of a dial central office.

You will need:

1. XY switch to be tested.
2. DA Form 2404 for recording test results.
3. DA Form 2407 for recording required maintenance actions.
4. XY switch test set 10E.
5. 48 volt DC power source.
6. Pen.
7. TM 11-2101.
8. TM 38-750.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the operation of the XY switch has been tested and evaluated as described in the performance measures and the references. These actions will be done in accordance with the safety precautions for working with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

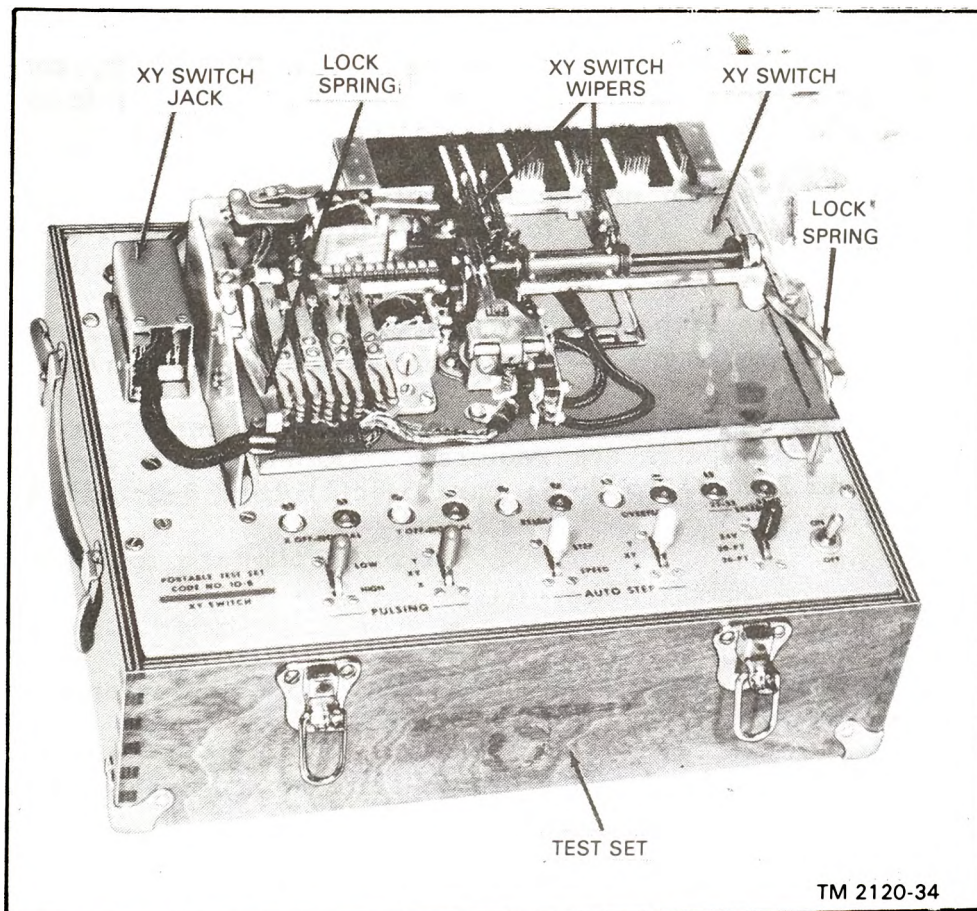


Figure 1. XY Switch Mounted on
XY Switch Test Set 10E

PERFORMANCE MEASURES

1. Obtain the required tools, equipment, and materials listed under CONDITIONS.

NOTE: During the final testing of the XY switch, compare the test results with the standards of equipment operation which are presented in the cited references.

2. Mount the XY switch on the XY switch test set and perform from test of XY switch. (Refer to TM 11-2101, para 95 thru 104, pp 93 thru 99.)
3. Determine whether the switch requires further repair based on the standards of equipment performance. (Refer to step 2.)
4. Record required entries in blocks 1 through 9 and block 16 of DA Form 2407, if repairs are required. (Refer to TM 38-750, para 3-9c(1) and 3-9c(2), p 3-28; para 3-8c(1) thru 3-8c(15), pp 3-23 thru 3-27.)

REFERENCES

TM 11-2101, Basic Maintenance Practices: XY Dial Central Office Equipment, Aug 58.

TM 38-750, w/C 1 and 2, The Army Maintenance Management System (TAMMS), May 78.

ACCP Subcourse SSO 418, XY Dial Central Office Maintenance.

ACCP Subcourse SSO 425, XY Dial Central Office Repair.

TASK**113-604-1010**

Install Inside Plant Cable

CONDITIONS

This task is normally performed in the controlled environment of a telephone central office.

You will need:

1. Cable to be installed in a telephone central office.
2. Equipment racks, cabinets, distributing frames, cable racks, ducts and conduits installed and aligned in the office.
3. Supervisor's instructions for installing the inside plant cable.
4. Wiring hand tools.
5. Fiber or phenolic tubing.
6. Sheet fiber.
7. Twine #6 and #12.
8. Measuring tape.
9. Paint.
10. Ink.
11. Paint brush.
12. Rubber stamps.
13. Chalk or grease pencil.
14. Stencils.

15. Fish tape.
16. Friction tape.
17. Cable tags.
18. Cable needle.
19. Shrinkable tubing.
20. Electrical tape.
21. Wire #18, #22, and/or #24 gauge AWG.
22. Soldering iron.
23. Rosin-core solder.
24. Cable clamps.
25. Wire wrapping tool (manual or electric).
26. Pen.
27. Pencil.
28. Central office cable records (DA Form 4204).
29. Cable running plan.
30. Manufacturer's wiring diagrams.
31. TM 11-2102.
32. CCTM 105-50-21.
33. TB SIG 222.

NOTE: Items 5 through 25 may or may not be required depending on type of installation being made.

Supervision and assistance are available.

STANDARDS

Task standard has been completed when the cable has been installed, and the cable records have been filled out as specified in the performance measures and the references. These actions will be done with electrical/electronic equipment, so that the equipment will not be damaged and maintenance personnel will not be injured.

PERFORMANCE MEASURES

1. Obtain the tools, equipment, and references listed under CONDITIONS.
2. Examine the equipment in the facility for the following defects. (Refer to CCTM 105-50-21, para 3-11d thru 3-11e, pp 3-50 and 3-51.)
 - a. Rust or scratches on the cable rack.
 - b. Threaded rods requiring the installation of fiber or phenolic tubing.
 - c. Stringers requiring sheet fiber covering cut, shaped and tied to fit them.
 - d. Cable rack cross straps requiring fiber protectors.
 - e. Lack of cable reel support.
 - f. Lack of cable guide rings.
3. Tag the cable at both ends. (Refer to CCTM 105-50-21, para 3-11j, pp 3-60 thru 3-62, and the cable running plan.)
4. Run the cable. (Refer to CCTM 105-50-21, para 3-11f thru 3-11i, pp 3-51 thru 3-60, and the cable running plan.)
5. Secure the cable. (Refer to CCTM 105-50-21, para 3-12 and 3-13, pp 3-65 thru 3-87.)
6. Butt and strip the cable. (Refer to CCTM 105-50-21, para 3-15, pp 3-91 thru 3-95.)

NOTE: If the equipment has no fanning strip or other wiring device, go to step 8.

7. Fan the cable. (Refer to CCTM 105-50-21, para 3-16, pp 3-96 thru 3-106.)
8. Sew the cable forms. (Refer to CCTM 105-50-21, para 3-14, pp 3-87 thru 3-91.)
9. Run required straps between terminals. (Refer to the manufacturer's wiring diagrams and CCTM 105-50-21, para 3-18, pp 3-119 thru 3-124.)
10. Connect the straps to the terminals in one or more of the following modes, as applicable.
 - a. Solder the connections. (Refer to CCTM 105-50-21, para 3-19, pp 3-125 thru 3-134; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
 - b. Wrap the connections. (Refer to CCTM 105-50-21, para 3-20, pp 3-134 thru 3-138.)
 - c. Connect the wires to 66-type connecting block terminals. (Refer to CCTM 105-50-21, para 3-22, pp 3-139 thru 3-143.)
11. Connect the cable wires to the terminals in one or more of the following modes as applicable:
 - a. Solder the connections. (Refer to CCTM 105-50-21, para 3-19, pp 3-125 thru 3-134; TB SIG 222, para 84 thru 89, pp 68 thru 71; para 55 thru 60, pp 2 thru 8.)
 - b. Wrap the connections. (Refer to CCTM 105-50-21, para 3-20, pp 3-134 thru 3-138.)
 - c. Connect the wires to 66-type connecting block terminals. (Refer to CCTM 105-50-21, para 3-22, pp 3-139 thru 3-143.)
12. Record the required entries on DA Form 4204. (Refer to TM 11-2102, para 185e, pp 155 and 156.)
13. Notify the supervisor that the cable installation has been completed.

REFERENCES

TM 11-2102, Installation Instructions, Step-by-Step Dial Central Office Equipment, Jun 50.

CCTM 105-50-21, Telecommunications Engineering - Installation Practices: (Installation - General), Mar 74.

TB SIG 222, w/C1, Solder and Soldering, Mar 60.

ACCP Subcourse SSO 421, Installation of Dial Central Office Equipment.

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Appendix A REFERENCES

DEPARTMENT OF DEFENSE (DOD)

5200.1-R Information Security Program Regulation

ARMY REGULATIONS (AR)

340-18-1 The Army Functional File System: General Provisions
 380-5 Department of the Army Supplement to DOD 5200.1-R (DODISPR)
 600-9 Army Physical Fitness and Weight Control Program
 611-201 Enlisted Career Management Fields and Military Occupational Specialties

DEPARTMENT OF THE ARMY PAMPHLETS (DA PAM)

310-4 Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders
 310-7 Military Publications: US Army Equipment Index of Modification Work Orders

FIELD MANUALS (FM)

5-15 Field Fortifications
 5-20 Camouflage
 5-34 Engineer Field Data
 7-7 The Mechanized Infantry Platoon and Squad
 * 7-8 The Infantry Platoon and Squad (How to Fight)
 21-6 How to Prepare and Conduct Military Training
 21-10 Field Hygiene and Sanitation
 21-11 First Aid for Soldiers
 21-20 Physical Readiness Training
 21-26 Map Reading
 21-40 NBC Defense
 21-41 Individual Defense: Nuclear, Biological, Chemical
 21-60 Visual Signals
 21-75 Combat Training of the Individual Soldier and Patrol-
 ling
 22-5 Drill and Ceremonies

*to be published

22-6	Guard Duty
23-9	M16A1 Rifle and Rifle Marksmanship
23-30	Grenades and Pyrotechnic Signals
35-20	Physical Fitness Training for Women

TECHNICAL MANUALS (TM)

3-4230-204-12&P	Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List) for Decontaminating Apparatus, Portable, DS2, 1 1/2 Quart, ABC-M11
3-4240-279-10	Operator's Manual: Mask, Chemical-Biological; Field ABC-M17/M17A1 and 71
3-4240-279-20&P	Organizational Maintenance Manual Including Repair Parts and Special Tools List: Mask, Chemical-Biological: Field, ABC M17/M17A1 and Accessories
3-6665-225-12	Operator's and Organizational Maintenance Manual: Alarm, Chemical Agent, Automatic: Portable, Man-pack, M8 Fixed Emplacement, M10 for Truck, Utility: 1/4-Ton, M11; Truck: 3/4-Ton, M12; Truck: 2 1/2-Ton, M13; Full-Track, Armored Personnel Carriers and Recovery Vehicles, M14; Carrier, Command and Reconnaissance, Armored: M15 w/ Power Supply for Truck, Utility: 1/4-Ton, M16; Truck: 3/4-Ton, M17 and Truck: 2 1/2-Ton, M18
9-1005-249-10	Operator's Manual: M16A1 Rifle
9-1330-200-12	Operator's and Organizational Maintenance Manual: Grenades, Hand and Direction: M18
10-277	Protective Clothing Chemical Operations
11-468	Substation Maintenance
11-471	Manual Telephone Central Office Installation
11-2064	Panels BD-132 and BD-132-A and Power Switchboard SB-361/TT
11-2101	Basic Maintenance Practices: XY Dial Central Office Equipment
11-2102	Installation Instructions, Step-by-Step, Dial Central Office Equipment
11-2103	Basic Maintenance Practices: Step-by-Step Dial Central Office Equipment
11-2104	Linefinder Equipment Step-by-Step Dial Central Office Equipment
11-2105	Selectors and Connectors Step-by-Step Dial Central Office Equipment
11-2106	Miscellaneous Switching Equipment: Step-by-Step Dial Central Office Equipment
11-2109	Distributing Frames and Line and Trunk Assignments Step-by-Step Dial Central Office Equipment

- 11-2110 Desk Equipment and Techniques Step-by-Step Dial Central Office Equipment
- 11-2111 Tools Testing Equipment and Common Supplies Step-by-Step Dial Central Office Equipment
- 11-2113 Connector Routine Test Set: Step-by-Step Dial Central Office Equipment
- 11-2114 Stepping-Switch Test Set (Step-by-Step Dial Central Office Equipment)
- 11-2116 XY Dial Central Office Equipment (Switching Circuits)
- 11-2118-15 XY Dial Central Office Equipment (Power, Ringing, and Supervisory Equipment)
- 11-2120 XY Dial Central Office Equipment (Tools and Testing Equipment)
- 11-2134 Manual Telephone Switchboard SB-86/P; Installation and Operation
- 11-2146 Central Office, Telephone, Manual, AN/TCC-7 and AN/TCC-7A; Telephone Central Office Group, Manual, AN/GTA-14(V) and Telephone Circuit Trunk Relay, TA-276A/TTC
- 11-4134 Manual Telephone Switchboard SB-86/P; Field Maintenance
- 11-4302 Tactical Switchboards and Long Lines Equipment; Repair Instructions, Apparatus Requirements
- 11-5805-201-35 Direct Support, General Support, and Depot Maintenance Manual, Including Repair Parts and Special Tools Lists: Telephone Set TA-312/PT
- 11-5805-298-15 Organizational, Direct Support, General Support, and Depot Maintenance Manual: Generator, Ringing, Static, TA-248/TT and TA-248A/TT, Including Repair Parts and Special Tool Lists
- 11-5805-357-14-2 Operator's, Organizational, Direct Support and General Support Maintenance Manual for Terminal Set, Telephone, AN/TCC-61
- 11-5805-482-15-1 Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Overseas AUTOVON Interface Components: 600-Ohm and 900-Ohm, Two-Wire to Four-Wire Telephone Repeater Terminating Units, and Four-Wire Voice Frequency Line Amplifiers
- 11-5805-482-15-2 Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Overseas AUTOVON Interface Components: 2600 Cycle Signaling Set with Self-Contained Oscillator

- 11-5805-482-15-3 Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools List: Overseas AUTOVON Interface Components: DX Signaling Equipment and Repeating Coils
- 11-5805-482-15-4 Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Overseas AUTOVON Interface Components: Two-Way PABX Routine Trunk Circuit with Pad Control and Pulse Correction; Two-Way PABX Routine Trunk Circuit with Pad Control; Pulse Correction Circuit for Two-Way PABX Routine Trunk Circuit
- 11-5805-482-15-5 Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Overseas AUTOVON Interface Components: Two-Way PABX Preemptible Interface Trunk Circuit with Pad Control and Pulse Correction: Universal Cord Applique for Two-Way PABX Preemptible Interface Trunk Circuits; H75650 Trunk Circuit Adapter for AUTELCO Syst 1000/2, M819/427-A1; H75650 Trunk Circuit Adapter for AUTELCO Syst 1000/1, M819/427-A2; H75650 Trunk Circuit Adapter for Siemens RP40 SWBD, M819/427-B; H75650 Trunk Circuit Adapter for Siemens PABX EMD SWBD, M819/427-H; H75650 Trunk Circuit Adapter for Telenorma SWBD, M819/427-K H75650 Trunk Circuit Adapter for Siemens-Eisenbahn System, M819/427-N; Two-Way PABX Preemptible Interface Trunk Equipment; H75650 Trunk Circuit Adapter for British Post Office No. 3 System, Part No. M189/427-C; H75650 Trunk Circuit Adapter for Cordless Siemens BASA/60 Volt System, Part No. 654-132-01 and 654-132-02
- 11-5805-613-14 Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List (Including Depot Repair Parts and Special Tools List): 48-Volt Battery System
- 11-5805-621-14/1/2 Operator's, Organizational, Direct Support, and General Support Maintenance Manual: XY Dial Telephone Central Office Equipment, Part I, Volume 2 (Maintenance Instructions)
- 11-5805-621-14/4 Operator's, Organizational, Direct Support, and General Support Maintenance Manual: XY Dial Telephone Central Office Equipment, Part 4 (Preventive Maintenance Instructions)

11-5805-640-13 Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Scanner Groups, Telephone Traffic OA-8746(V)1/GT and OA-8746(V)2/GT

11-5805-641-13 Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Recorder Group, Signal Data OA-8744/GT

11-5805-642-13 Operator's, Organizational, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools Lists) for Counter Groups, Digital, OA-8745(V)1/GT and OA-8745(V)2/GT

11-5805-643-13 Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools Lists: Decoder Group OX-32/GT

11-5805-695-12 Operator's and Organizational Maintenance Manual for Switchboard, Telephone SB-3614(V)/TT

11-5805-695-34 Direct Support and General Support Maintenance Manual: Switchboard, Telephone SB-3614(V)/TT and Test Set, Electrical Surge Arrestors TS-3655/TT and TS-3655A/TT

11-6130-220-15 Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Rectifiers RA-91, RA-91A, RA-91B, and RA-91C

11-6625-202-14 Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Test Set, Relay TS-1775/U

11-6625-251-15 Organizational, Direct Support, General Support, and Depot Maintenance Manual: Test Set, TS-140/PCM; Signal Generators SG-15/PCM, and SG-15A/PCM, and Decibel Meters, ME-22/PCM and ME-22A/PCM

11-6625-366-10 Operator's Manual for Multimeter TS-352B/U

11-6625-366-15 Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Multimeter TS-352B/U

38-750 The Army Maintenance Management System (TAMMS)

COMMUNICATIONS COMMAND TECHNICAL MANUAL (CCTM) (See note below)

105-50-21 Telecommunications Engineering-Installation Practices (Installation-General)

TECHNICAL BULLETINS (TB)

SIG 222 Solder and Soldering

NOTE: If CCTM 105-50-21 is not available on job cite, order from:
Headquarters, USACC, ATTN: USACEEIA, Ft Huachuca, AZ 85613

TRAINING CIRCULARS (TC)

3-3

How to Use the Automatic Chemical Agent Alarm

TRAINING EXTENSION COURSE (TEC) LESSONS

911-441-0034-F	Snake Bites and Hot Weather Hazards
911-441-0035-F	Cold Weather Hazards
929-441-0042-F	Personal Hygiene: Care of Feet
929-441-0043-F	Environmental Hazards, Part 1: Treatment of Drinking Water
930-071-0013-F	Introduction to Land Navigation
930-071-0014-F	Measuring Distances and Azimuths
930-071-0016-F	Terrain Features
930-071-0018-F	Navigating with Map and Compass
931-061-0060-F	NBC: The Mask
931-061-0061-F	NBC: Masking and When to Do It
931-061-0065-A	NBC: Maintenance of the M17 Series Mask
935-071-1029-F	Counterintelligence
937-061-0030-F	Cover, Camouflage, and Concealment, Part 1
939-071-0009-F	Loading and Unloading the M16A1 Rifle
939-071-0010-F	Disassembly and Assembly of the M16A1 Rifle
939-071-0011-F	Maintaining the M16A1
939-071-0012-F	Preventing and Correcting Common Malfunctions
942-071-0001-F	The Hand Grenades - Types and Uses
942-071-0002-F	Hand Grenade Maintenance and Identification
942-071-0003-F	The Hand Grenade - Carrying, Arming, and Throwing

ARMY CORRESPONDENCE COURSE PROGRAM (ACCP)

ITO 100	Safeguarding of Defense Information
SSO 411	Local Battery Telephone Switchboards
SSO 414	Maintenance of the Common-Battery Telephone System
SSO 415	Step-By-Step Dial Central Office Equipment
SSO 416	Step-By-Step Dial Central Office Maintenance
SSO 417	XY Dial Central Office Equipment
SSO 418	XY Dial Central Office Maintenance
SSO 420	Dial Central Office Power and Supervisory Equipment
SSO 421	Installation of Dial Central Office Equipment
SSO 422	Mobile Multiple-Position Central Offices
SSO 424	Step-By-Step Dial Central Office Repair
SSO 425	XY Dial Central Office Repair

MISCELLANEOUS

C 5-2-9

C 21-1-3

C 21-1-4

Map Reading Coordinate Scales and Protractor

M16 Maintenance Card

Rifle Shot Group Analysis Card: Semiautomatic,
Automatic Fire - M14, M16A1 Rifles

Appendix B

TIPS FOR PLANNING YOUR TRAINING PROGRAM

This group of charts will assist you in planning your MOS training program. These charts may be used to help you through the maze of references listed for each task. They will lead you to the best training material for your program.

The charts are designed to show major task areas. Some task areas are common to all soldiers, other areas are for administration and procedures, and some relate to the main types of equipment used within your MOS. Under each major area, you will find modules containing one or more job tasks. The modules may cover a single piece of equipment or a group of procedures within your field. For each module, there is a list of the best training material available to you in your unit. Sometimes supporting material is listed that you may find useful as a substitute if the best training material is not available. It would be a good idea to glance over one of the charts before you proceed.

To make up your training plan, start on the left-hand side of each chart and check off those modules in which you feel you should be better qualified. There may be some modules listed on the chart in which you are well qualified. The task modules you have checked form your plan. After going through each chart and selecting the modules you need, go back and list the modules in an order that will do you the most good.

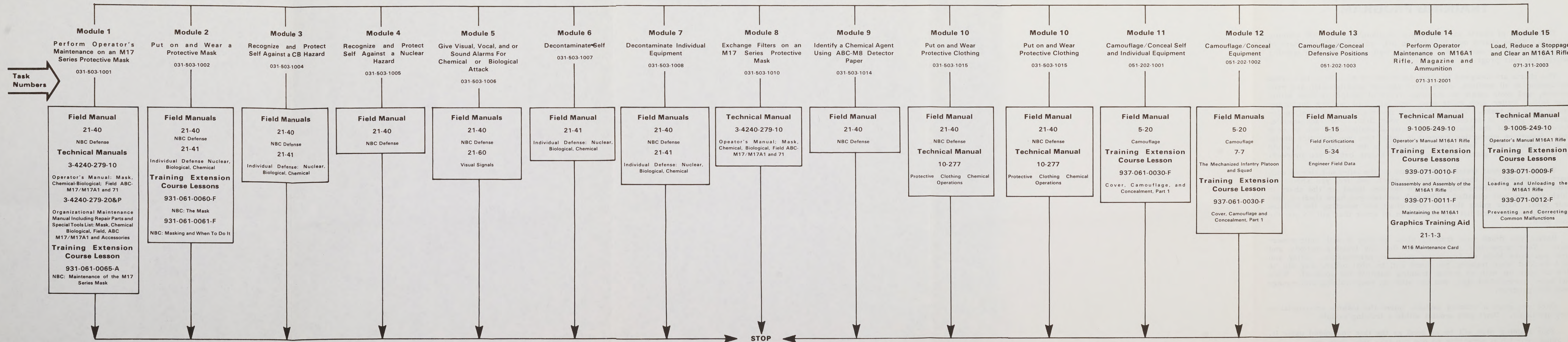
Before you finish your training plan, go over it with your supervisor. Your supervisor can help you find the training material and give you more ideas on improving your job performance. After you have decided what training you need and in what order, you will be able to come up with an overall training calendar for yourself. When you have accomplished this, you can start on your training and manage your own program.

Once you start a training module, follow the lessons or material as they are listed. Don't skip around within a training module.

Your training plan will be as good as the time you spend using it. Knowing your job is something no one can take away from you.

Common Tasks

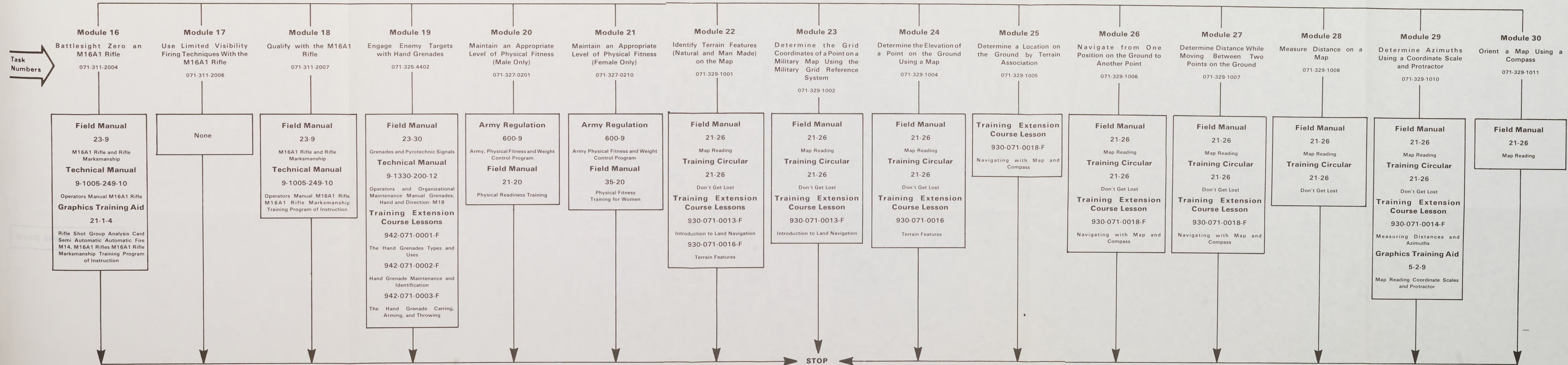
Task Groups



Guide:

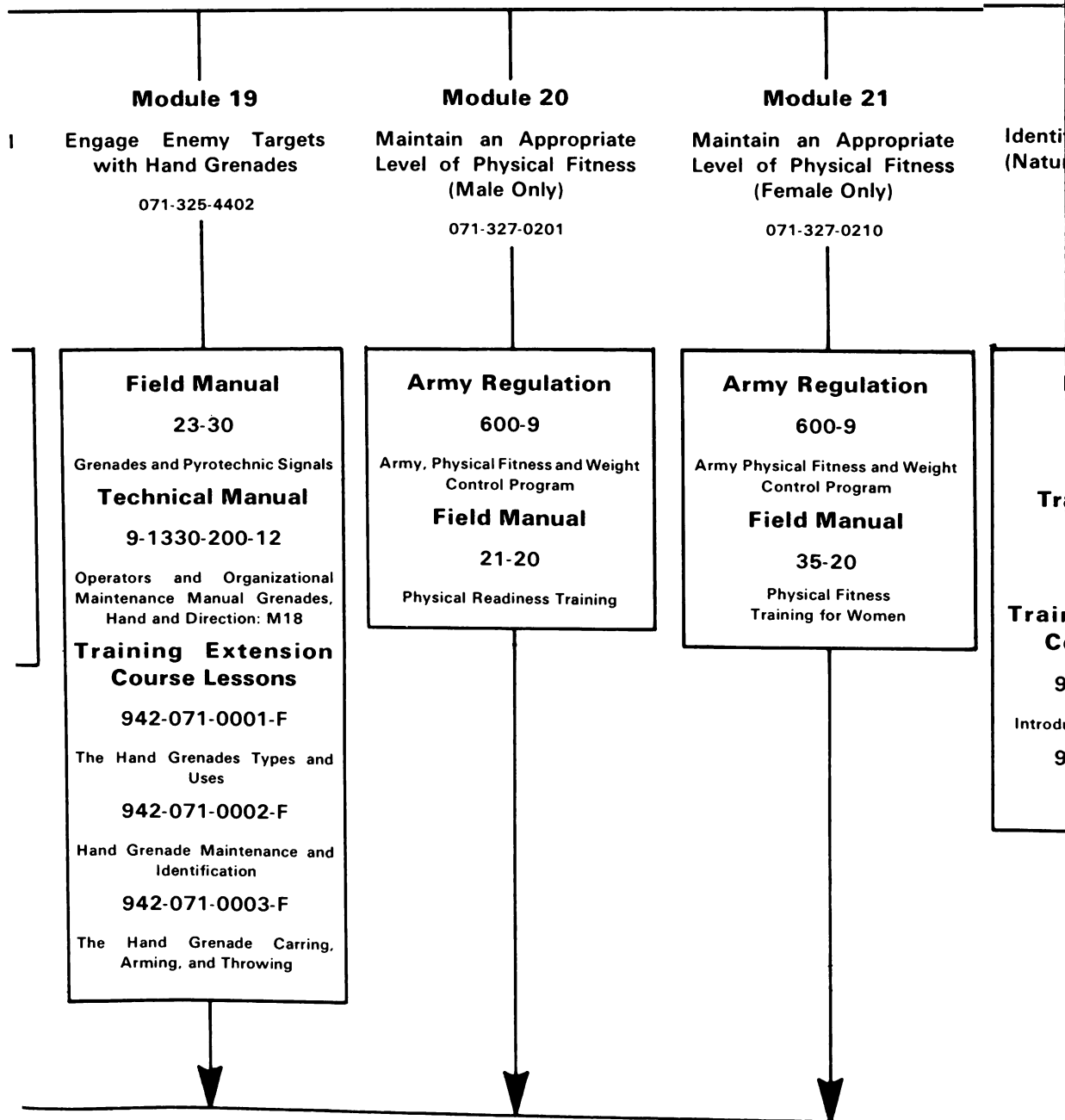
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2. TEC lessons within each task group must be taken in order.

Common Tasks (Con't)

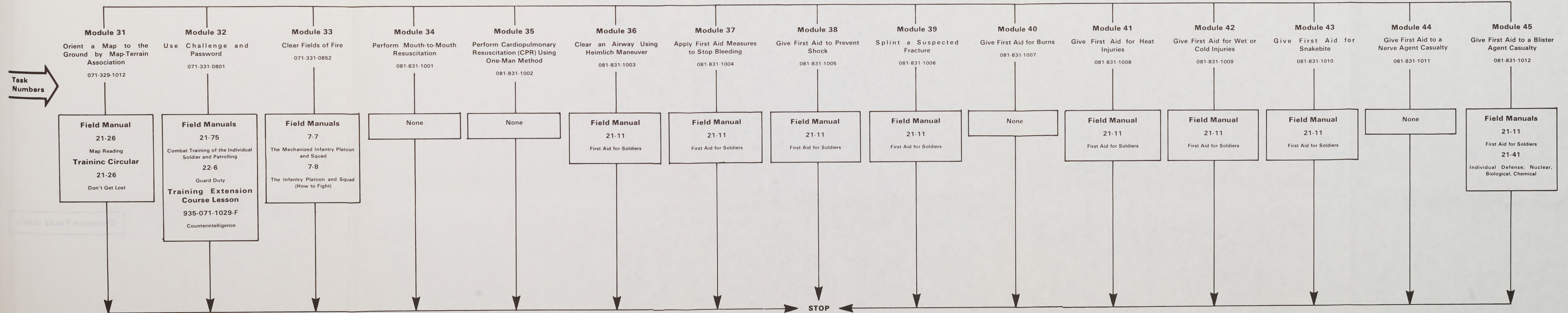


Guide:

1. Task groups may be taken in any order.
2. TEC lessons within each task group must be taken in order.

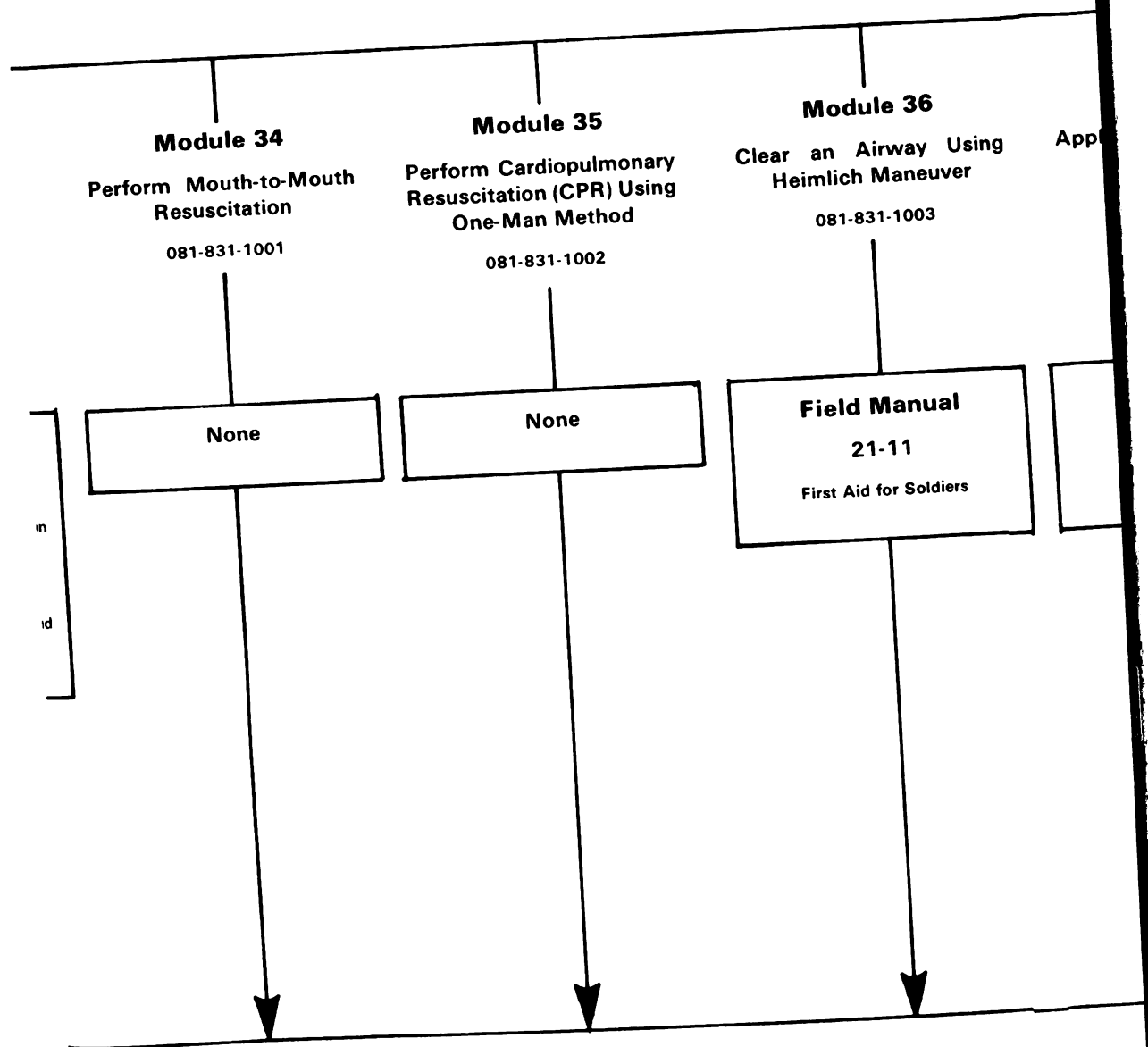


Common Tasks (Con't)

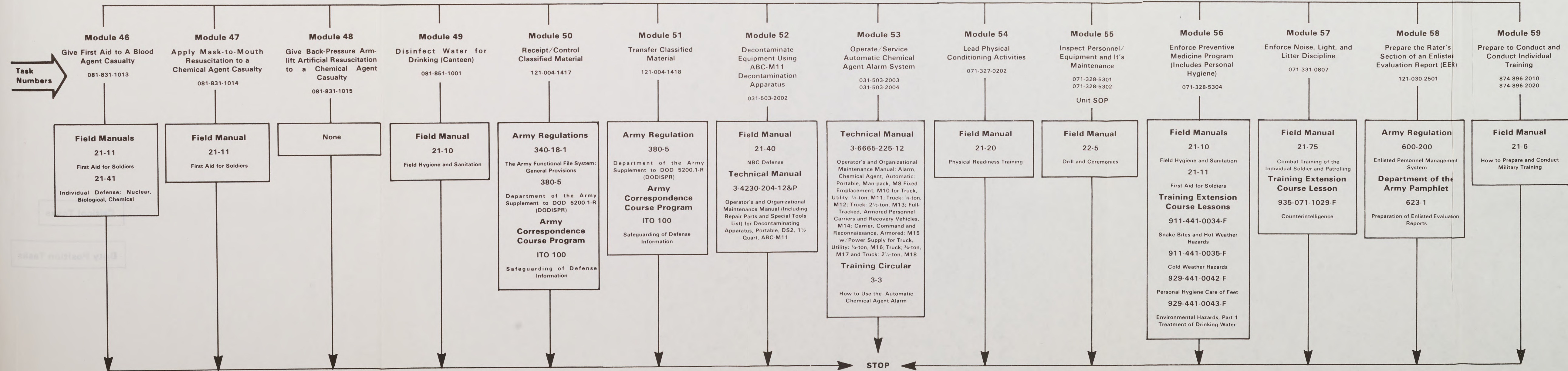


Guide:

1. Task groups may be taken in any order.
2. TEC lessons within each task group must be taken in order.

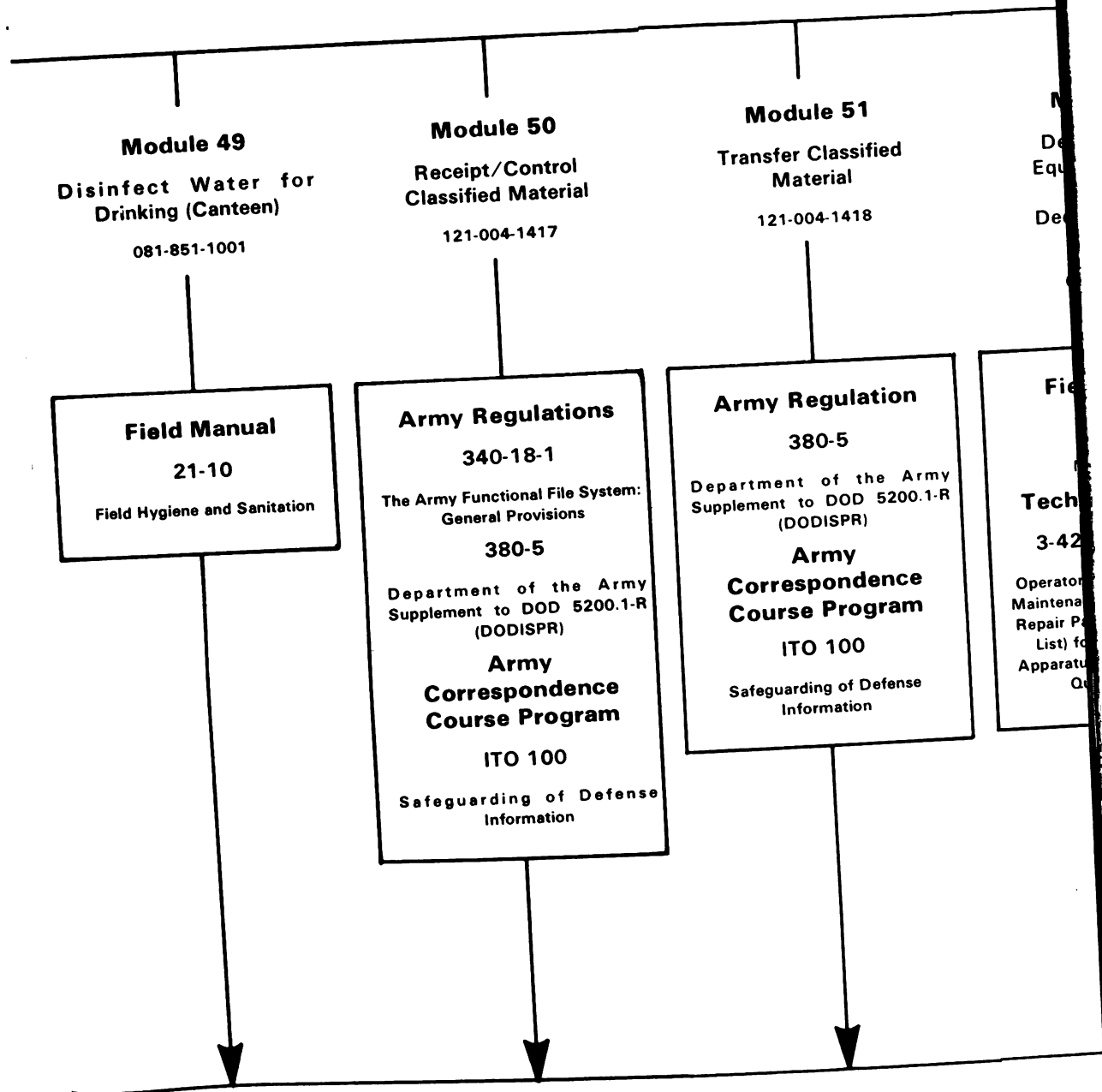


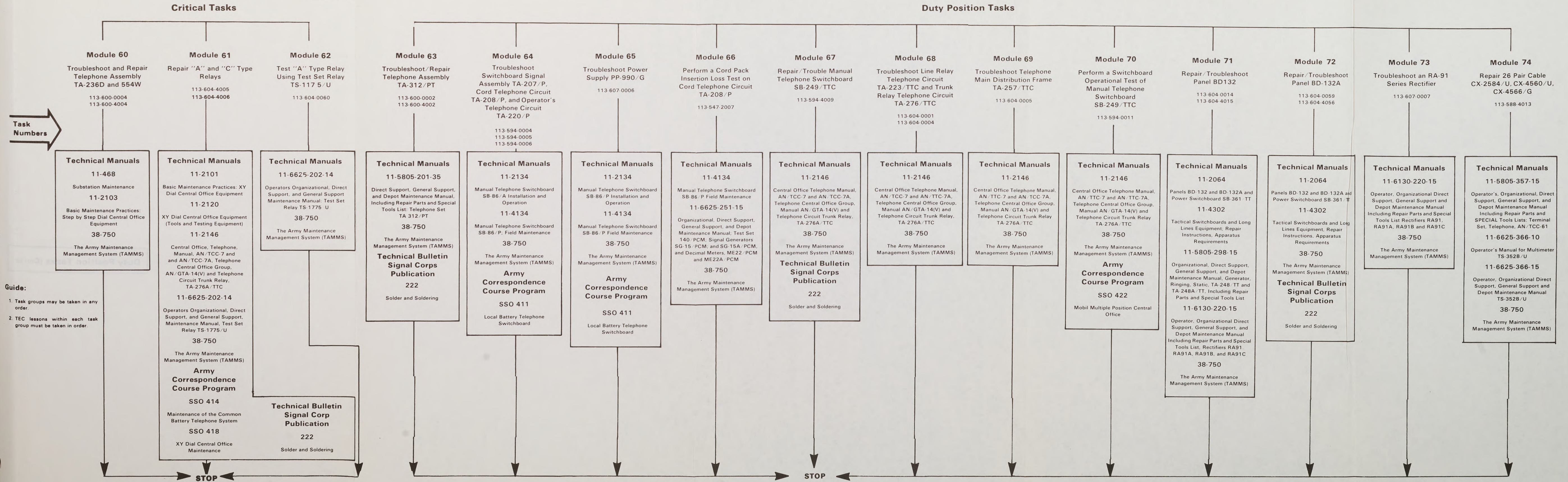
Common Tasks (Con't)



Guide:

1. Task groups may be taken in any order.
2. TEC lessons within each task group must be taken in order.





Module 63

Troubleshoot/Repair
Telephone Assembly
TA-312/PT

113-600-0002
113-600-4002

Technical Manuals

11-5805-201-35

Direct Support, General Support,
and Depot Maintenance Manual,
Including Repair Parts and Special
Tools List: Telephone Set
TA 312/PT

38-750

The Army Maintenance
Management System (TAMMS)

**Technical Bulletin
Signal Corps
Publication**

222

Solder and Soldering

Module 64

Troubleshoot
Switchboard Signal
Assembly TA-207/P,
Cord Telephone Circuit
TA-208/P, and Operator's
Telephone Circuit
TA-220/P

113-594-0004
113-594-0005
113-594-0006

Technical Manuals

11-2134

Manual Telephone Switchboard
SB-86/A Installation and
Operation

11-4134

Manual Telephone Switchboard
SB-86/P: Field Maintenance

38-750

The Army Maintenance
Management System (TAMMS)

**Army
Correspondence
Course Program**

SSO 411

Local Battery Telephone
Switchboard

Module 65

Troubleshoot Power
Supply PP-990/G

113-607-0006

Technical Manuals

11-2134

Manual Telephone Switchboard
SB-86/P Installation and
Operation

11-4134

Manual Telephone Switchboard
SB-86/P Field Maintenance

38-750

The Army Maintenance
Management System (TAMMS)

**Army
Correspondence
Course Program**

SSO 411

Local Battery Telephone
Switchboard

Perfo
Inser
Cord

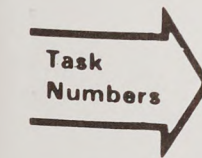
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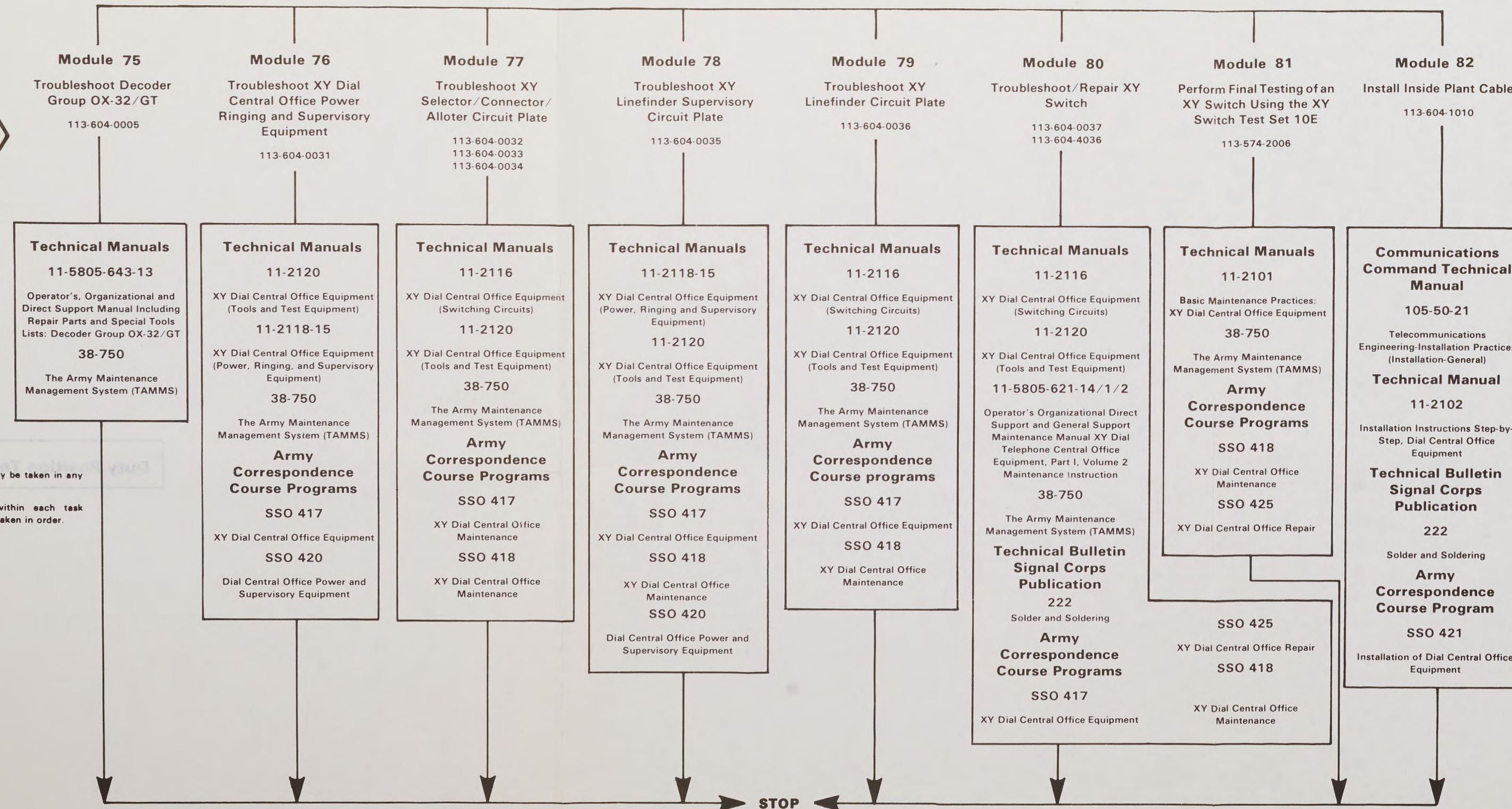
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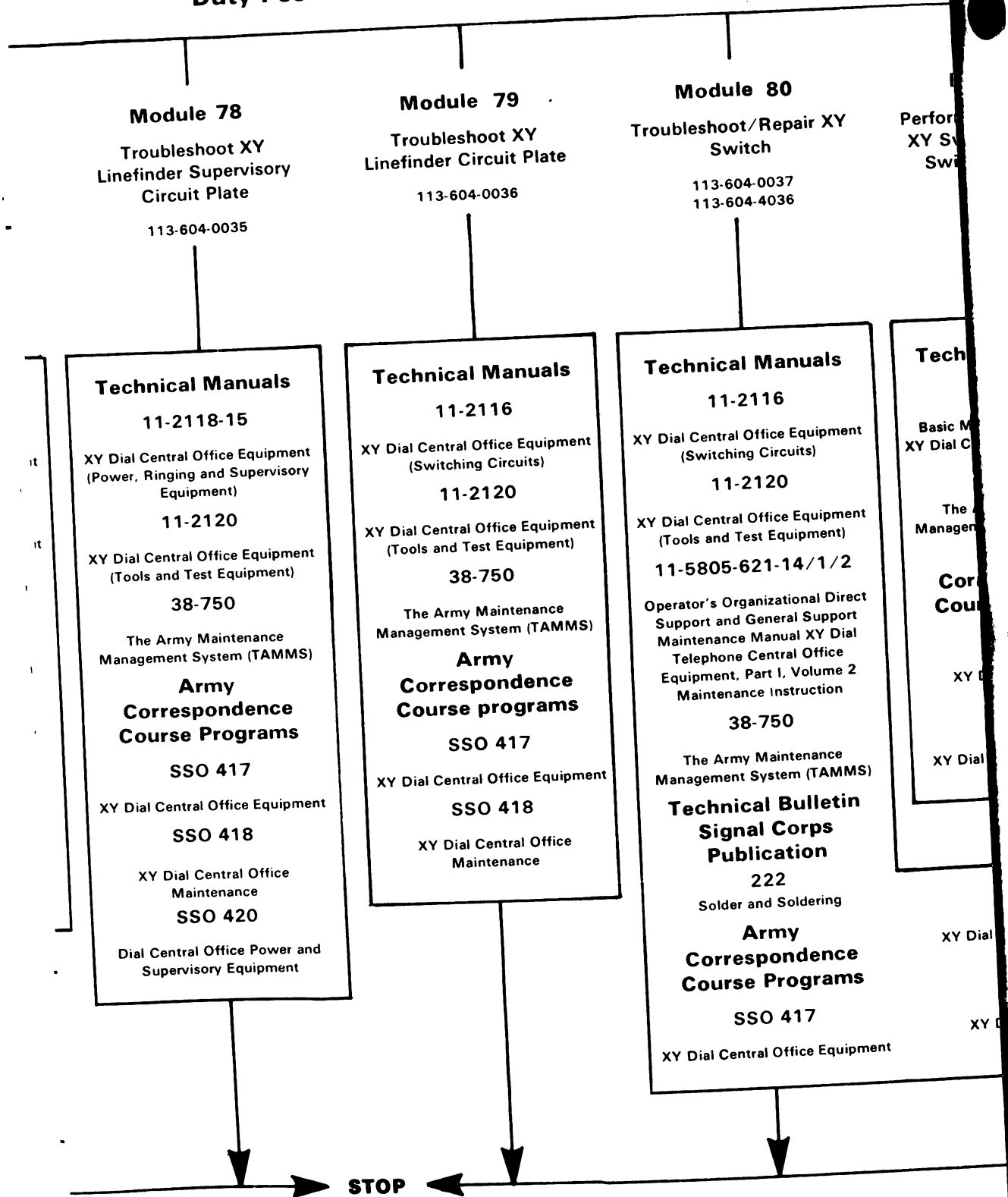


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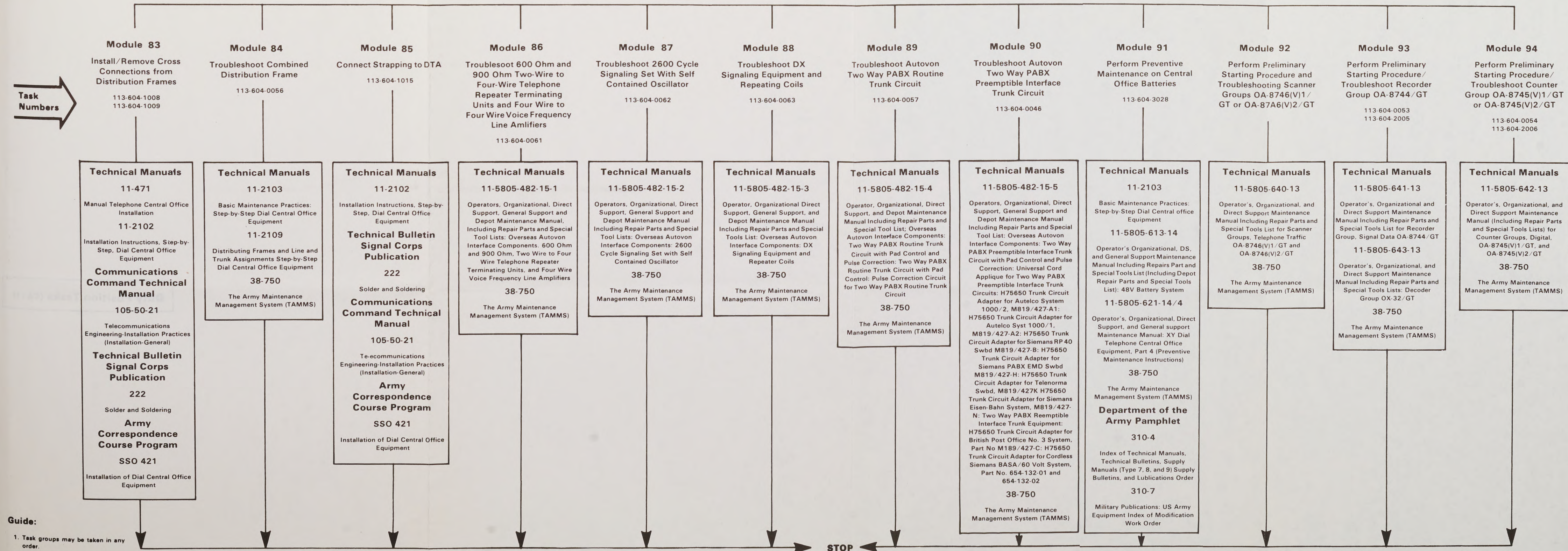
1. Task groups may be taken in any order.
2. TEC lessons within each task group must be taken in order.



Duty Position Tasks (Con't)

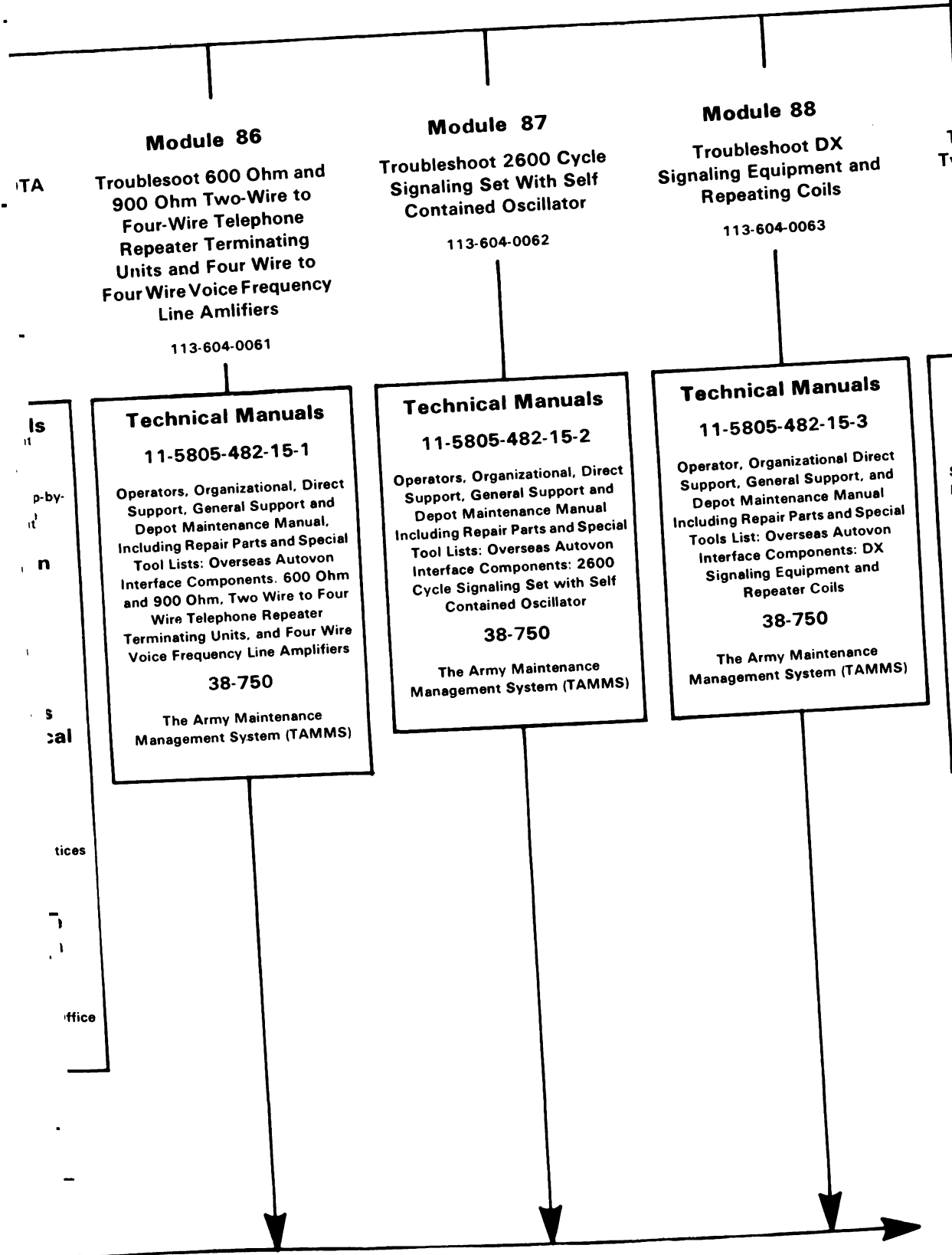


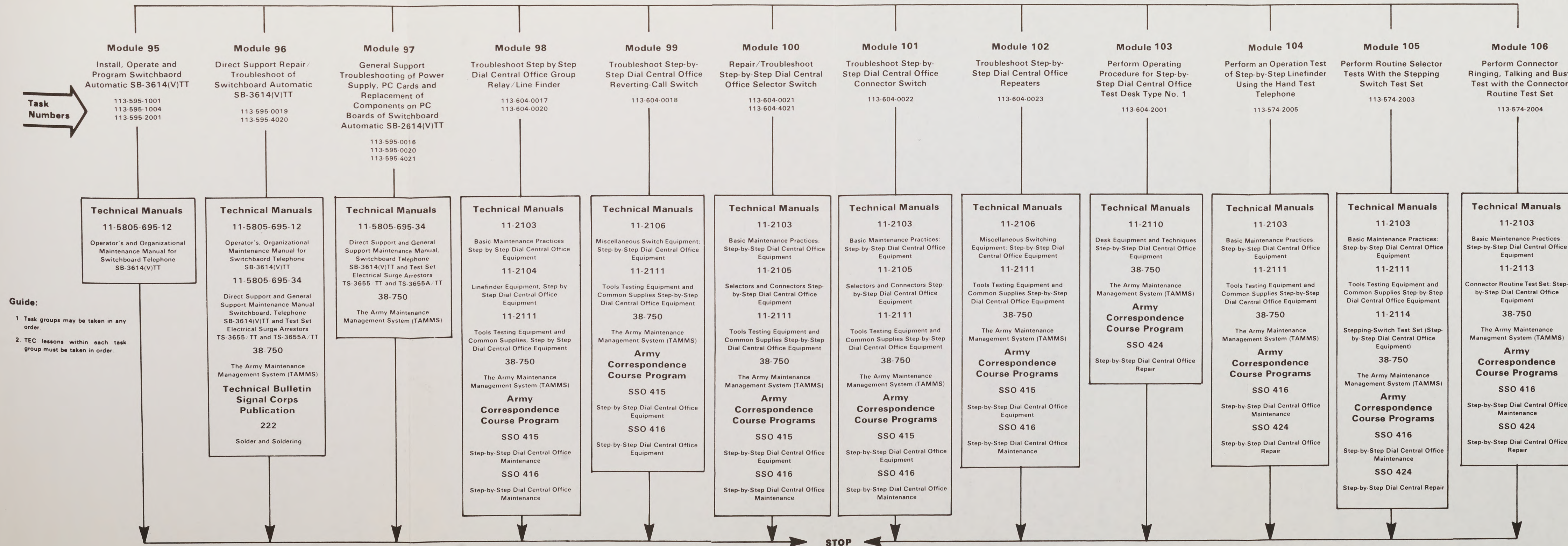
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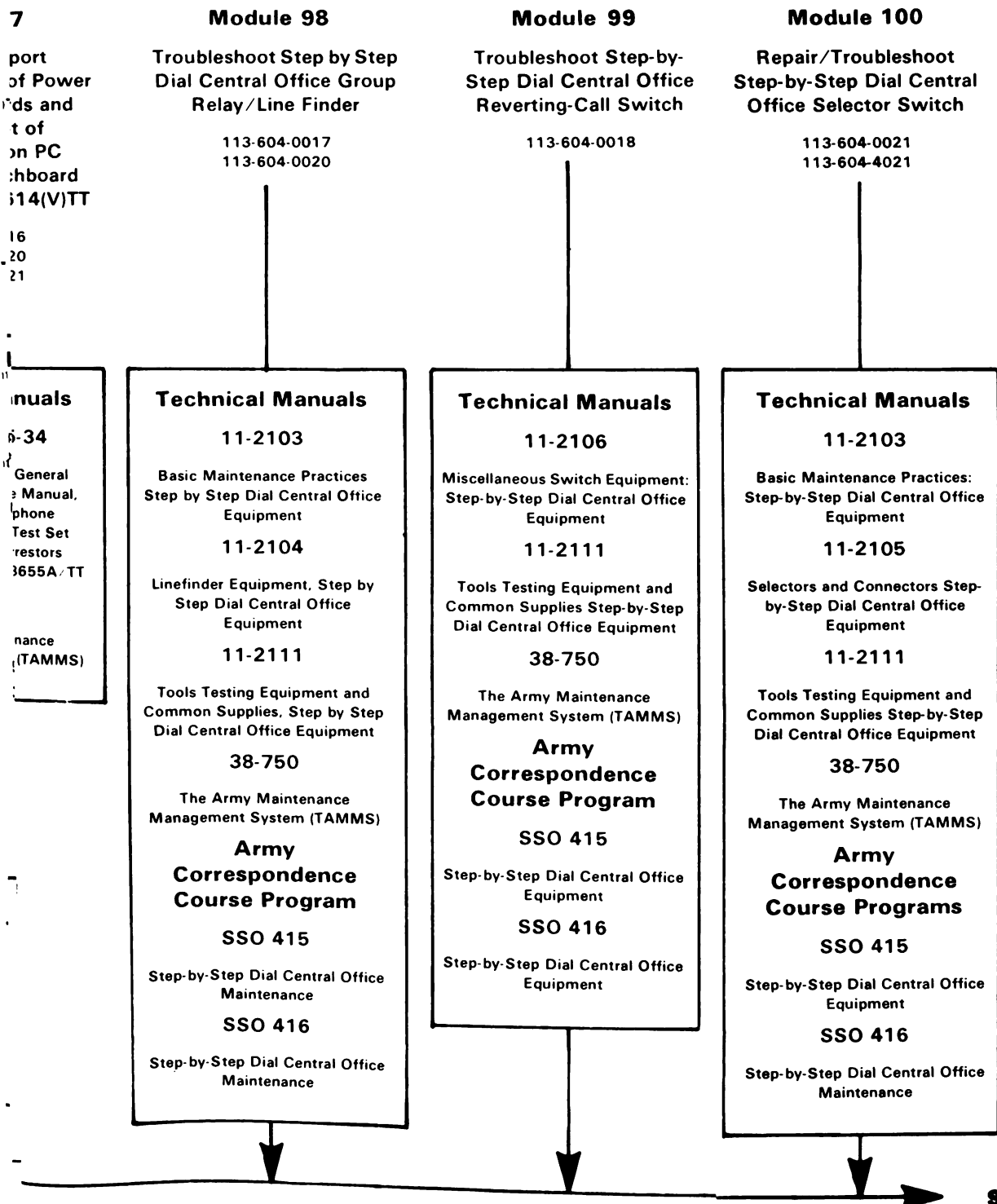


Guide:

1. Task groups may be taken in any order.
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Appendix D

QUESTIONNAIRE

As the user of this manual, you are a vital member of our writing team. Please provide us your opinion and suggestions by filling out this questionnaire. Be sure to include your name, AUTOVON number, and unit so we can follow up on your suggestions.

UNIT ADDRESS _____

AUTOVON _____

DUTY POSITION _____

NAME _____

TIME IN GRADE _____

RANK _____

TIME IN SERVICE _____

1. Are there any tasks that should be added? ☐ Yes ☐ No

2. Are there any tasks that should be dropped? ☐ Yes ☐ No

3. What would you do to improve the organization of the task list?

4. Did you have any trouble finding what you needed in this manual? ☐ Yes ☐ No

5. Did you have any trouble understanding the material in this manual? ☐ Yes ☐ No
 If your answer is Yes, which part(s) was unclear?

6. Were the CONDITIONS the way you normally perform each task? ☐ Yes ☐ No

7. Did you disagree with any of the STANDARDS? ☐ Yes ☐ No

8. Did the PERFORMANCE MEASURES help you perform the tasks to the STANDARDS listed? ☐ Yes ☐ No

9. Did this manual help you to do a better job? ☐ Yes ☐ No

10. Did you find any errors? ☐ Yes ☐ No
 If answer is Yes, please list.

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11. Should information from other publications be included in this manual? ☐ Yes ☐ No
If your answer is Yes, which and why.

12. Trainers Only: Did this manual help you improve the combat efficiency of your organization? ☐ Yes ☐ No

13. What would you do to improve this manual?

14. Comments:

Thank you for your time. Please remove this questionnaire, fold in half, staple, and drop in the mailbox.

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FM 11-36H1/2

26 FEBRUARY 1980

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
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